THE IRON AGE

New York, July 14, 1927

ESTABLISHED 1855 VOL. 120, No. 2

Making Steel for Munitions

Cooperation Between War and Navy Departments and Industry— Progress in Metallurgy Hastened by Military Demands

BY MAJOR R. R. NIX

WHILE the first iron was reduced from its ores by the Hittites 3000 or 4000 years ago, and used to form more efficient implements of war than the previous bronze weapons, the process lapsed through the ages. The first real advance in this metallurgy, after thousands of years, came about 1340, when iron makers of Central Europe succeeded in casting iron. They accomplished this step by a new type of furnace built of masonry, inclosing a vertical shaft in the form of two truncated cones placed end to end, resembling the modern blast furnace. Ore, flux and wood-charcoal were charged in at the top and air blown in at the bottom. The largest castings during the sixteenth century were two or three tons, which permitted a great upward limit to the size of cannon.

FIVE of the Vital Elements of Imports into the United States Are Vanadium, Chromium, Manganese, Tungsten and Nickel, Shown Above by Their Initials. Diagram indicates the approximate proportion of our imports of each of those ores which is furnished by each chief supplying country. There are 14 countries listed, only four of which furnish more than one element

Gun Barrels for Street Lighting

Prior to 1812 gun barrel tubes were made by hand from plates which were bent into cylinders, with edges overlapped and welded over a mandrel. About 1815 a Scotch inventor, William Murdock, conceived the idea of screwing together old musket barrels in the form of continuous tubes for conducting coal gas for lighting purposes. The popularity of this lighting system stimulated inventors to produce tubes more rapidly and at lower cost. Whereas the tube industry was first advanced by the invention of the flint lock gun in 1640, the adaptation of these gun barrels to the use of conducting gas for lighting purposes likewise caused a revolution in the art of tube making.

The use of iron as a recognized unit of ship construction dates back to 1818. Steel came into use between 1870 and 1875. The American Navy has pioneered the seas with iron and steel ships. In fact, the first turret ship was the Monitor, of Civil War fame, with a belt of 8-in. built-up armor protecting 11-in. turret guns. The turret design is significant from a metallurgical standpoint in that a race was started in naval ordnance between the supremacy of gun and of armor, which was reflected favorably in the improvements required in steel making.

Quality Steel for Naval Ships

A signal influence on the steel industry resulted from the building of four naval vessels, the Chicago, Atlanta, Boston and Dolphin, because of the high quality of steel demanded. Enormous difficulty was experienced in meeting the specifications, but in the end the manufacturers learned the art of making good steel. This was a typical example of what we call an "Educational Order." The Chester Rolling Mills, Chester, Pa., Norway Iron & Steel Co., South Boston, Park Brothers & Co., and the Phoenix Iron Co., Philadelphia, supplied the steel, and the contractor, John Roach, Chester, Pa., built a mill to handle certain of the material. The first ship built, the Dolphin, was completed in 1885, was placed out of commission in 1921, and sold by the Navy in 1922—not a bad testimonial as to the quality of this steel.

The Midvale Steel Works received from the army

Abstract of a paper read before the Army Industrial College, May 5. Many of the charts accompanying the original paper are confidential and cannot be here reproduced. They illustrate in great measure the plans for industrial preparedness undertaken by the office of the Assistant Secretary of War and in process of establishment with industrial leaders.

the first large order for steel gun tube forgings placed in the United States (1883). Here is another example of an "Educational Order," in that it did much to increase the knowledge and experience of the Midvale Co. in the manufacture of good steel. In 1887 the Midvale Steel Works satisfactorily completed a stern frame steel casting for the Charleston weighing 6720 lbs., the first large steel casting ever attempted. This pioneer work of the Navy in encouraging the steel castings industry led to the use of large steel castings by the railroads for locomotive frames and other structural parts, and consequently advanced by many years the large production of the steel casting industry.

While further tests of cast iron rifles were practically abandoned in the United States in 1871, the feasibility of making steel cast guns up to 10 in. caliber, with weight of casting 60 tons, was conceded by 1887. In this year the Pittsburgh Steel Casting Co. and the Standard Steel Casting Co. started the manufacture of steel cast 6-in. high-powered rifles for the Navy. Both Army and Navy ordnance, however, were at this time, within the limit of appropriations provided by Congress, encouraging the steel industry to still further progress in the manufacture of high-grade steel.

Making Gun Forgings

The Otis Iron & Steel Co., Cleveland, Jones & Laughlin, Pittsburgh, and Trenton Iron Co., Trenton, N. J., were engaged in fabricating parts of a 10-in. wire-wound steel gun. The Bethlehem Iron Co. was engaged on a naval order for 1225 tons of steel gun forgings for 6, 8, 10 and 12-in. calibers. Up to the end of 1887 the Midvale Steel Co. had turned out 320 tons of gun forgings for the Navy and 168 for the Army and the Cambria Iron Works 17 tons for the Army.

Other commercial steel works engaged on fabricating parts of built-up forged steel guns about this time were the West Point Foundry, South Boston Iron Works, Nashua Steel Co. and Firth-Sterling Steel Co. Experience in the matter of fabricating built-up forged steel guns gained by all these establishments and applied to commercial lines of endeavor far outweighed the relatively small tonnages involved.

A good example of the immediate application of the technical experience of that time (1887) is given on page 104, "Gun Making in the United States," Birnie. "The method of improving the quality of car axles by treating by the so-called water tempering process at the Cambria Iron Works is largely due to the care and research made by the capable officers of that company in studying the manufacture of ordnance metal."

Metallurgical Improvements Localized

Knowledge of making and heat treating high-grade steels and alloys and the development of heavy shaping machinery was confined to the establishments engaged on ordnance work, in spite of the fact that the great mechanical and industrial revolution was already well launched and its progress necessarily dependent upon the use of steel in steam engines, electric machines, gas engines and machine tools.

The first armor plant in this country resulted from the efforts of the Navy persuading the Bethlehem Iron Co. (subsequently Bethlehem Steel Corporation) to undertake the project. "To satisfy ordnance requirements in the manufacture of enormous gun forgings, thick, heavy armor plate and large steel castings, special machinery had to be designed.* Naturally, the cost of development was borne by the Bureau of Ordnance, but in the end the nation as a whole benefited.

"With a view to producing metal-cutting tools which would economically machine heavy armor plate and gun forgings, the Bethlehem Steel Co. developed the well-known 'Taylor-White' process of treating high-speed steel. This steel is now used in metal-cutting tools that, by many, are considered as having revolutionized machine shop practice throughout the world.

Discovery of Alloys and Their Uses

"The world was searched for methods of manufacture of suitable armor plate, and in the search and subsequent laboratory investigations of the effect of alloying steel with various other ingredients, and of novel heat treatments of steel, there were discovered or evolved many of the special alloys of iron with nickel, chrome, vanadium and other metals which today are of the utmost importance to industry in general. The Bureau of Ordnance paid for many of those experiments, allowing great laboratories to be supported, thus permitting this most important work to be carried on to the highest degree of success. As a result of continued experiment in the production of high-grade steels suitable for Navy purposes an impetus was given to this industry which carried it along to the present day, where it now stands at the head of the steel industry of the world."

While the automobile industry fell heir to this wealth of experience, its phenomenal growth created a wide and ever increasing demand for high-grade alloy steels and thereby served to enrich this field of metallurgical research, particularly in the past 20 or 30 years.

Cold Working of Steel

For the past four years extensive tests have been conducted at Watertown Arsenal on the cold working of tubes from the interior by hydraulic pressure. The primary purpose of these experiments is to develop rapid production of gun and shell forgings. There is a promise, even in the larger calibers, that a single tube subjected to cold working may replace the forged steel built-up gun, since an ideal condition of stresses exists throughout the metal to resist interior powder pressure. The inner layers are in a state of compression, decreasing gradually to zero at an ideal place in the wall of the tube. Outward from this neutral zone the metal is set in a state of tension, increasing to a maximum at the outer surface. A factor of safety is gained beyond the elastic limit of the metal, depending principally upon the gap between the elastic limit and the ultimate strength of the material.

In this connection seamless tubes have given very satisfactory results for 75-mm. shell. In a general way the physical qualities of the metal are improved by stretching beyond the elastic limit in much the same way that wire is improved by drawing. This process has met with such success that the Ordnance Department has adopted it as the standard method of constructing guns not to exceed 6-in. bore. The Navy has also used this method satisfactorily for guns up to 6-in. caliber. Their machine is installed at the Washington Navy Yard. This process of cold working has already received commercial application for rims of large flywheels and for cylinders of high-pressure engines.

Molybdenum in Steel

Among problems mentioned in the metallurgy of steel which will tend to improve the quality of metals, both for ordnance and for commercial purposes, the use of molybdenum is of interest. Determination of the effect of addition of molybdenum to steels on the physical properties and also on the Charpy test is being undertaken. Results of these tests are particularly interesting in that they suggest that molybdenum may be satisfactorily substituted for nickel in an emergency for use in gun steels, or as is now being done in automobile steels.

Investigation of the practicability of developing high-speed tool steel, using molybdenum as the principal alloy, is being conducted in cooperation with the Climax Molybdenum Corporation of America. It

*"The United States Navy as an Industrial Asset," Office of Naval Intelligence, revised to July 1, 1924.

promises to result in a molybdenum high-speed tool steel superior to the commercial compositions. Elimination of the necessity of using tungsten in high-speed steels will solve one of our major problems in strategic materials.

Three years' experience in the X-ray laboratory indicates that the radiographic method is a success and may be relied upon in commercial practice to detect sub-surface defects in gross structure. Moreover, X-ray metallography investigations permit measurements of actual distance between at most within an accuracy of 0.1 of an atom diameter under ideal conditions. Such novel investigations are bound to result in greatly improved steels, since a better understanding is now possible between elemental structures, chemical analysis and physical properties, and the effects of heat treatment, alloying constituents and other making, shaping or treating processes on those elemental structures. For example, investigations already disclose that cold working produces changes in the atomic spacing such as are caused also by heat treating steel.

Cooperation of Interests

Before explaining the cooperation between the office of the Assistant Secretary of War and the steel industry, the indirect contributions of the Army Engineer Corps to the development of the steel industry deserve special mention. Lieut. George Washington Whistler, Corps of Engineers, introduced in the construction and design of the primitive American locomotive such superior style of workmanship that he may well be considered responsible for the real beginning of the American locomotive and engine industry. Incidentally he was the inventor of the whistle for locomotives.

The first American-built locomotive, Peter Cooper model of 1829, had boiler tubes improvised from gun barrels. This model was used on the Baltimore & Ohio Railroad, upon which Whistler was employed (1828-1829) as an associate engineer, having charge of the first mile of track laid on this road, this being the first track for passenger cars put down by any company in this country. From this early start the railroads now require 28 per cent of the enormous steel production of the United States.

The work of the War Department steel committee thus far has resulted in considerable economy in obviating the necessity for many surveys on steel mills, particularly for strictly commercial items. With our knowledge of capacities and requirements being perfected from time to time, the dislocation and confusion which occurred in the past war may be effectively averted. Among the numerous difficulties which resulted from lack of planning in the World War the case of the projectile is typical. Crosshauls and delays in production necessitated a complete reallocation of all orders

Up to Christian Era

Wrought Iron

Used for Weapons

Ancient Hittites, 2000 B. C.
Greeks—Alexander, 320 B. C.
Romans—Julius Caesar, 50 B. C.
Britons at time of Caesar.

Discovery of America 1492

Cast Iron

First blast furnace developed by iron makers of Central Europe, 1340.

Revolutionary War 1775

Steel

Cementation process revived in Belgium, 1600 and crucible in England, 1742.
Coke in blast furnace, 1619.
First iron works America, 1619.
Flint-lock gun stimulates tube industry, 1640.
Hot blast American, 1719.
Rolled sheet iron, 1728.
Ferroalloys discovered:
Nickel, 1751; Manganese, 1774; Tungsten, 1781; Molybdenum, 1782.

War of 1812

Limited Capacities

Furnaces 1 to 6 tons a day.
Crucibles up to 124 lb.
First American steamboat, 1807.
Musket barrels used for gas line stimulated tube industry, 1815.
Iron recognized standard for ships, 1818.
Lt. Whistler and the American locomotive, 1829.
Ferroalloy discovered: Vanadium 1830.
First steam hammer, 1838.

Civil War 1861

Large Capacities

Mechanical and industrial revolution launched.
Henry Bessemer to advance artillery design began to operate works of Sheffield in 1860.
First American Bessemer Converter, 1867 (and first dynamo).
Spiegeleisen (low alloy of iron and manganese) introduced in Bessemer process to handle other than Swedish ores to prevent hot shortness (low in Mn., high in P.).
Siemens open-hearth regenerative principle, 1864.
Battleship Monitor, the first turret design, of Civil War fame, started race between armor and projectiles.
Cast iron guns abandoned, 1871.
Blast furnace capacity 100 tons a day; converter, 3 to 5 tons; original open-hearth, 5 tons.

Spanish-American War 1898

Metallurgical Improvements

Basic Bessemer (used abroad) Thomas Gilchrist used basic lining and added lime giving high C. low P. steel, 1878. Sir W. Siemens developed electric arc furnace, 1879—gradually substituted for crucible after 1900.
Testing machine Watertown Arsenal, 1875.
First steel for ships, 1870-1875.
Development automobiles since 1880.
Naval contracts for steel ships, 1883, improved knowledge of art.
First American armor plant, Midvale, 1883.
Bethlehem and Midvale working on first large orders for steel gun forgings, 1885.
First large steel casting for stern frame of Chicago gave impetus to use by railroads, 1887.
High-speed tool steels developed at Bethlehem for machining armor, 1890.
Industrial and mechanical revolution well launched and automobile industry creates wide demand for alloy steels and stimulates improvements in metallurgy.

Entry in World War 1917

Recent Developments

At Watertown Arsenal, Boston, Mass.
1. Cold working of tubes.
2. X-ray metallography.
3. Centrifugal castings.
By Air Corps of Dayton, Ohio.
Standardizing aircraft design.
By Industrial Mobilization Plans.
By Integrating blast furnace, steel plant and rolling mill.
Development of aircraft since first design of 1897 to the status of a major industry in United States, creating large demand for highest quality of metals.

Present Capacities

Blast furnaces up to 600 tons in a 24-hr. day.
Open-hearth furnaces, 75 to 100 tons each, averaging 15 heats a week, except as duplexing units, with 40 heats a week.
Bessemer up to 600 tons a day, 15 tons a heat.
Crucible, maximum heat, 124 lb.
Electric, maximum heat, 50 tons.

for projectile steel before the end of 1917. From page 122 "American Industry in the War" (Baruch), the following extract is self-explanatory:

Poor Planning Corrected

"To illustrate: A Buffalo steel manufacturer was making an enormous tonnage of projectile steel to be shipped in bar form to a Cincinnati forge plant to be forged into projectile forgings, which were in turn to be shipped back to Buffalo for machining into finished projectiles. A steel plant within 50 miles of Cincinnati was making projectile bars which were being sent to Buffalo for forging and machining. Arrangements were made to have the steel bars rolled in Buffalo shipped to near-by plant and machine shop for finishing, and in turn the Cincinnati forge man was supplied by the steel mills in his district.

"There were hundreds of changes of this character which, while difficult of solution, were fully justified by the transportation situation, which had become a very important factor in our war program. Many millions of ton-miles and an enormous amount of money and time were saved by those changes." While similar conditions do prevail among certain industries in time of peace, they should be eliminated in the event of a major war.

Outstanding facts to military men in this historical survey are: (1) The incentive of the steel industry is to attain large scale production most economically. (2) The incentive of Army and Navy engineers is to produce the best quality of steel for battle efficiency. While this military incentive is not to be lost sight of in industrial planning, early mass production demands that we adapt our requirements as far as practicable to commercial standards.

Adequacy of Strategic Materials

Moreover, industrial planning should not only assure the adequate mobilization of the steel industry but should render America self-contained in the strategic materials which enter into the manufacture of steel and its alloys—principally ferromanganese, tungsten and nickel. Fortunately, from the standpoint of national defense, the commercial demand for high-quality steel is well established. With the gradual advance of the airplane to the status of a major industry in this country, it is to be anticipated that marked improvements in metallurgy such as accompanied the growth of the automobile industry may evolve on a wide and sound economic basis.

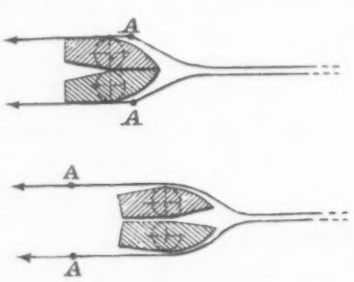
Educational orders so-called are planned with the idea of acquainting manufacturers with the processes, inspections and particular requirements for ordnance steel. In many cases these differ markedly from commercial practice. Consequently the Government reimburses the plant for expenditures in running small orders through the mill, in the effort to work out all "kinks" and "bugs" in advance of an emergency. This will insure the earliest possible production of technical materials when demanded.

Separating Steel Sheets Which Stick

Ingenious Device Developed in Germany for Saving Large Scrap Losses in Sheet Mills

AFTER multiple rolling of sheets, sticking causes enough trouble in the average sheet mill to produce a heavy loss through sheets which are torn or otherwise damaged in separating. In many cases this loss runs from 5 to 10 per cent, or more.

To obviate this difficulty and save much of what has hitherto been a loss, a German invention has been put into operation in Continental sheet mills which, it is said, recovers in perfect condition about 70 per cent of the stickers. In one works in which this device has been installed, and where the production is about



Showing Sectional Form of the Oscillating Bars, Over Which the Sheets, with Ends AA, Are Slowly Pulled. The bars oscillate rapidly and separate the sheets by tiny increments at each opening of the jaws

1500 tons per month of sheets, varying from No. 20 to No. 34 gage, about 7 per cent previously were either partly or entirely wasted, owing to the difficulty and cost of separating by hand. This figure has been reduced to about 2 per cent by the use of the new machine, which recovers the separated sheets quite flat and without the kinks or other imperfections resulting from hand unsticking. A small proportion still becomes torn in the operation, but most of these may be trimmed to smaller dimensions, thus reducing the scrap to exceedingly small proportions.

As shown in the illustration, which gives the working element of the machine, simplicity is a feature. Occupying a floor space about 6 x 8 ft., including driving motors and controlling gear, the machine consists essentially of two bars of sections as shown, which oscillate at 600 cycles per min. One motor of 5 kw. drags the sheets over the oscillating bars, while a 3-kw. motor keeps the bars in oscillation. The dragging speed can be varied to suit the gage and condition of the sheets being separated.

Passing the edges of the sheets *AA* over the entrance wedge of the bars, as shown in the upper portion of the cut, grips are attached at *AA*, which securely hold the sheets. The machine is then started up and the sheets are pulled slowly over the rapidly oscillating bars. When the whole length of the sheet has been pulled over the bars, the top sheet, now separated from the others, is removed and any remaining sticking sheets, if more than two were in the pack, are returned to the starting point and put through the machine again.

Two laborers or boys operate the machine. Standard sheets, 6 ft. 6 in. long x 3 ft. 3 in. wide, are separated at the rate of one operation per min. The average outputs of six 10-hr. shifts taken at random from the records of the machine are given in the table. Our data and illustration are from a letter of John A. Smeeton, published in *Engineering*, London.

Date	Sheets Fed to Machine	Sheets Recovered	Scrap or Reduced in Size	Time in Minutes
Dec. 21.....	397	365	32	433
Dec. 22.....	365	329	36	305
Dec. 27.....	402	365	37	344
Dec. 28.....	426	329	97	486
Dec. 29.....	430	350	80	432
Dec. 31.....	375	334	41	386
Six days.....	2395	2072	323	2386

Recuperators for Open-Hearth Furnace

Whether They Should Be Used at All Depends upon Local Conditions—Some of the Limitations Pointed Out

OPEN-HEARTH furnace recuperators form the subject of a paper* presented some weeks ago before the Engineers' Society of Western Pennsylvania by W. H. Fitch, Allentown, Pa. Some of the pertinent points in the discussion of that paper are covered in the following paragraphs. In these it was brought out, in sharp contrast with Mr. Fitch's views, that it is questionable whether, with our present refractories, the use of the recuperator system would prove practicable. Matters such as rate of furnace operation, necessary draft to pull the gases out of the furnace, etc., which are separate altogether from the heat balance or heat efficiency program, nevertheless have a vital effect on the balance sheet of the open-hearth department and on its productive returns.

Limit to Utilization of Heat

It is impossible to take away from the waste gases from the open-hearth furnace more heat than the air which enters the furnace is able to take up. This statement is from W. Dyrssen, chief engineer, furnace equipment department, Blaw-Knox Co., Pittsburgh. In other words, there is a fixed relation between the quantity of waste gases and air, on the one hand, and the amount of heat which can be transferred from the waste gases to the air in the regenerative system, on the other. If the quantity of waste gases is three times as great as that of the air, it would be impossible to utilize more than about one-third of the heat in the waste gases.

Waste gases bulk anywhere from two to four times as great as the air which enters the furnace. This statement is independent of the kind of fuel. Great improvements have been made lately in this ratio by making the open-hearth furnace as tight as possible. This prevents infiltration of air into the system, but the improvements thus attainable seem to have a limit far below the ideal.

That the waste gases could be cooled down from 1400 deg. Fahr. to 500 deg. by installing recuperators was stated in the paper. For the reason just mentioned it is improbable that such an ideal condition could be reached at all. In fact, the temperature of the total waste gases can be reduced only a few hundred degrees.

Furthermore, the gases coming from the open-hearth checkers at 1400 deg. cannot be considered as waste gases coming from a furnace at 1400 deg. The temperature of the gases from the checkers will depend upon what happens in the checkers themselves. If we introduce hot air into the checker chambers we upset the balance of the heat in them, so that the gases will be hotter. We must, therefore, study carefully the balance of the open-hearth furnace system as a whole before we can get an idea of what can be gained by installing a recuperator.

Probable Amount of Gain Obtainable

More heat to the open-hearth furnace can be returned by the installation of a recuperator, only if we raise the temperature of the air after it has passed through the checker chambers, that is, at the entrance into the furnace. Temperature of air entering the hearth at present is likely to average about 2000 deg. Fahr. Waste gases leaving the hearth will average about 2700 deg. From these figures we might expect, by installing sufficient checkers and recuperators, to raise the air temperature about 350 deg., or to about 2350 deg. Fahr.

This temperature rise corresponds to only a few per cent of heat in the fuel. This relatively small gain in percentage, however, will probably have a great influence on the working of the furnace. It will increase the flame temperature considerably and will make more heat available in the furnace. There probably will be a considerable gain in tonnage and a corresponding reduction in fuel required per ton of steel.

We can, however, expect to utilize only a portion of the heat in the waste gases. We should therefore not attempt to take more than a certain portion of the waste gases through the pre-heater, because it is necessary to use an exhauster to pull them through the air heater, and this exhauster cannot work properly above 600 deg. Fahr. In the arrangement shown in the paper, all the waste gases are pulled through the recuperator. In such case their temperature will be at least 1100 deg. It would be impossible to handle them in an exhauster at that temperature.

Rate of Operation of Furnace

In studying saving heat units, whether by regenerators or recuperators, said Dr. J. S. Unger, manager research bureau Carnegie Steel Co., Pittsburgh, certain things come up in practice. We believe we can make steel more cheaply if we put a recuperator on the open-hearth furnace and reduce the temperature of the gases going up the stack. The open-hearth manager says, however:

"I have two furnaces exactly alike. On one furnace the stack temperature is 1200 deg. and I can make a heat in 7½ hr. On the other furnace the stack temperature is 750 deg. and I require 10½ hr. to make a heat."

When the stack temperature is high, said Dr. Unger, the combustion and draft are good, the furnace is working fast and a heat is made in 7½ hr. Now a furnace burns approximately the same amount of fuel per hour. From this it follows that low stack temperatures do not always indicate an economical furnace.

Refractories Provide One Limit

In considering the possibility that the sensible heat of the waste gases of an open-hearth furnace may be returned to the furnace, said T. J. McLoughlin, fuel engineer Carnegie Steel Co., Duquesne, Pa., it must be remembered that there is a limit. To have all the sensible heat above 500 deg. Fahr. in the outgoing gases returned as sensible heat with the incoming air is impossible in open-hearth furnaces fired with producer gas. Refractory material necessary to withstand the resulting temperatures is not now commercially available.

Mr. McLoughlin presented a heat balance for an open-hearth furnace. He concluded from it that, with a flame temperature of 3100 deg., beyond which it is inadvisable to go with present refractories, 788 deg. Fahr. is the lowest point to which the stack temperature may be reduced by returning to the furnace the sensible heat in the waste gases.

With the present type of regenerator and the heat transfers obtained in open-hearth practice it would require 27,500 sq. ft. of heating surface to secure this result. Many existing plants could not possibly install this. Perhaps, as has been suggested, the desired result might be accomplished within the available space by means of recuperators. Two difficulties, however, might be encountered in such an installation.

Dust might settle out in the recuperator, thus clogging it up. He found this to vary between 1 and 2.2 lb. an hr. on a 75-ton furnace. The other difficulty would be found only in adapting recuperators to existing installations. It is that the draft losses, through the combined regenerator and recuperator, would be beyond the stack capacity and, therefore, tend to slow up the furnace. This condition would be aggravated toward the end of a campaign, when the regenerative chamber would be clogged or partially so.

*THE IRON AGE, March 31, Page 920.

Sintering Performance and Costs

Magnetic Concentrates Readily Handled — Improvements in Equipment and Practice —Future Trend

BY EDWARD J. TOURNIER

THREE men operate a one-pan plant where the flue dust or other raw material is dumped into their respective bins at the plant. One of the men operates the proportioning and mixing devices on the ground floor, and two men operate on the pan floor. In one plant in Tennessee two men operate the whole plant after the raw materials are brought to the plant, and produce about 150 tons of screened sinter per day. With two pans, one additional man is needed in the proportioning and mixing room. In a three-pan plant, another operator is required on the pan floor.

Total cost of sintering flue dust in a plant making 200 tons a day should not exceed $1 per ton, and it is being done for less. In sintering an ore, the cost should not exceed 75c. per ton and it is being done regularly for less than 70c. The tonnage produced on a 10 by 24-ft. pan in 24 hr. varies from 200 to 450 tons per day, depending entirely upon the charge being sintered.

Although every effort has been made to build sintering plants to be efficient, leaving as little as possible to depend upon the skill of the operators, it is impossible to make a plant fool-proof. The management can settle the question of grate openings, depth of bed, suction, etc. It can supply the best type of equipment for conveying, feeding, mixing, screening and charging the materials. But the three most important essentials must be left to the men running the plant. These are: proportioning the raw materials, mixing and ignition. These three things are being done almost continuously, and carelessness on the part of the operators can easily upset the operations at any moment.

In most operations, carelessness on the part of the operators is quickly noticed in the poor quality of the finished product. This need not be so in a sintering plant. Great tonnages may be sent through the plant and good sinter be produced; but the tonnage of sinter may be extremely small, due to the fact that the raw materials are not properly mixed and ignited. The unsintered material is screened out of the sinter and keeps circulating around and around the plant in the form of return fines. There may be no delay or shutdown all day, but the tonnage of sinter produced will be small.

[This is the third and concluding installment of a comprehensive article on intermittent sintering, by Mr. Tournier. The first appeared in THE IRON AGE of March 17, page 775; the second, April 21, page 1139. A second series, to cover continuous sintering practice, will follow.]

Sintering Magnetic Concentrates

DESCRIPTION of the apparatus and methods in use for sintering flue dust by the intermittent process applies equally well to other materials. The only important difference is in the thickness of the bed being sintered. For certain ores, as much as 15 in. is recommended, whereas with blast furnace flue dust it is not advisable to go much above 7 or 8 in. in thickness. Briefly to indicate some minor differences, the sintering plant of the Witherbee Sherman Co. at Port Henry, N. Y., may be used as an example.

Magnetic concentrate is sintered at this plant. The size of the particles being sintered varies with the ore, some requiring much finer crushing than others for successful concentration. The size of particles is

Table Feeders in the Greenawalt Sintering Plant of the Bethlehem Steel Co. at Lebanon, Pa.

largely a question of concentrating the ore and not of sintering. However, the bulk of this material will pass through a 3/16-in. opening, and of course it varies from this size to impalpable dust.

This ore is brought from the mines in railroad cars and dumped into bins, six of which are located beneath the railroad trestle. One bin is for coke or fine anthracite coal used for sintering. The best size of this material will pass through a screen having ⅛-in. openings. Underneath each bin is a table feeder, which properly feeds the material from the bins on to a belt conveyor in the right proportion. The belt conveyor carries the mixture of ore and fuel to one end of the sintering plant, where it is deposited on a belt running beneath all of the hoppers under the screens for screening the sintered material.

When the pans are dumped after sintering, the material flows over an inclined screen and from 15 to 25 per cent of fine material passes through the screens into hoppers underneath. This material, returned for sintering, is uniformly fed out on the belt on top of the regular charge coming from the ore bins above referred to.

This material, the main sintering charge, is passed through a cylindrical mixer, where the proper amount of moisture is added. It is then elevated to the top of the sintering plant and there separated into two portions. The coarser portion, fed directly upon the grates, constitutes a porous layer for the support of the regular charge. This coarse layer consists of previously sintered material and other larger particles that might be in the material. This layer generally consists of all materials above ¼ to 3/16 in., depending upon the material to be treated.

Improvements in Mechanical Equipment and Operating Methods

1. Increased suction.—The most successful plants are using suction from 40 to 45 in. of water, against 20 to 25 in. previously. This has contributed much to the capacity of the sintering apparatus. The latest Greenawalt flue dust plant is producing 300 tons of finished sinter in 24 hr. in a pan 10 ft. wide by 24 ft. long, sintering a layer 8 in. thick.

2. The method of charging the layer of material into the pans has been improved, so as to deposit the ore without compression, having the layer of ore as loose and fluffy as it is possible to deposit it.

3. Larger grate openings.—Experience has demonstrated that, as the grate opening is increased, the capacity of sintering increases until a point is reached where the grate has about 14 per cent of opening. After this, additional opening does not contribute materially to increased sintering capacity. Ordinarily, additional grate opening would be a simple enough proposition, but in downdraft sintering, especially in an intermittent apparatus where strong suction is used, it is not an easy matter to construct a grate having this opening and still having sufficient body or metal to resist the heat and corrosive action of the gases passing through. The two items receiving the most "punishment" in a sintering plant are the grate and the fan impeller, the grate on account of the hot sinter and hot gases coming in contact with it and the fan impeller on account of the particles of dust inevitably carried through with the gases.

4. The factor of dumping the pan by giving it a complete revolution.—This, in itself, saves a small amount of time. But the important factor is that it has enabled us, by means of a sliding weight, to give proper mechanical movement to the grates without complicated mechanism.

Performance and Production Costs

AN Eastern sintering plant operating with three pans 10 x 24 ft. on magnetic concentrates averaged 30,000 tons of sinter per month from April to August, 1926. Under favorable conditions, production costs per ton are as follows:

Labor	12c.
Maintenance and repairs	10
Power	12
Handling materials	5
Fuel	36
Overhead	4
Royalty	10
	89c.

It is of interest to note the results of blast furnace practice, as affected by the use of sinter. Best month, using magnetic concentrates as total burden of ore, September, 1923, as follows:

Combination Mixer and Dryer for Handling Wet Concentrates Used at the Lebanon, Pa., Plant of the Bethlehem Steel Co.

Average pig iron per day .....314 tons
Coke used per ton of pig iron.....2,614 lb.
Kind of iron made .....Foundry

Best month, using mixture of half concentrates and half sinter, March, 1924.

Average pig iron per day .....415 tons
Coke used per ton of pig iron.....2,064 lb.
Kind of iron made .....Basic

Best month, using sinter as total ore burden, March, 1925.

Average pig iron per day .....536 tons
Coke used per ton of pig iron.....1,828 lb.
Kind of iron made .....Foundry

Future Trend of Intermittent Sintering

PRESENT tendency in plant construction and equipment is toward simplification and massive build, to reduce wear and tear. The tendency in sinter output is toward mass production, so that unit costs may be reduced to the minimum.

It is indicated by the experience with 100 per cent sinter at the plants of Witherbee Sherman Co., Port Henry, N. Y., Chateaugay Iron Co., Lyon Mountain, N. Y., and other Eastern furnaces, that the preparation of magnetic ores will increase in usefulness. The beneficiation of fine ores will increase in importance, due to the constantly decreasing percentage of iron in shipping ores. The need and successful use of sintered magnetite concentrates has been thoroughly demonstrated. In the case of limonite or hematite ores, however, the same advantages have not yet been fully established, for the reason that these ores cannot be cheaply concentrated.

Nevertheless, further investigation of the possibilities of sintering such materials affords reasonable expectation of additional and plentiful supplies of blast furnace material.

Machinery Manufactured in United States

Census Report for 1925 Shows More Than Five Billions—This Does Not Include Automobiles or Other Transportation Equipment

PRODUCTION of machinery, excluding transportation equipment, in 1925 is reported by the Census Bureau at $5,020,281,100, an increase of 6.2 per cent over $4,727,818,290 in 1923. Nearly half the total is covered under foundry and machine shop products not specifically designated elsewhere. This group accounted for $2,232,985,974 and registered a reduction of more than 4 per cent from 1923. Electrical machinery apparatus and supplies at $1,540,002,041 was in second position, showing a gain of nearly 20 per cent over 1923. No other group reached $180,000,000, the largest being metal-working machinery, including machine tools, with an aggregate of $175,592,488. Other classes of machinery are covered in detail in the table.

Manufacture of Machinery in the United States, Not Including Transportation Equipment: 1925 and 1923

	Census Year	Number of Establishments	Wage Earners (a) (Average Number)	Wages	Cost of Materials	Value of Products	Value Added by Manufacture (b)
Total for the group	1925	11,807	858,843	$1,225,359,140	$1,985,367,067	$5,020,281,100	$3,034,914,033
	1923	12,147	907,707	1,253,742,642	1,891,524,166	4,727,818,290	2,836,294,124
	1921	12,395	662,277	832,782,828	1,361,163,280	3,235,074,906	1,873,911,626
Agricultural implements	1925	303	28,696	37,387,620	73,850,060	169,467,966	95,617,906
	1923	*312*	*30,962*	*40,510,534*	*63,491,886*	*151,286,248*	*87,794,362*
Cash registers and calculating machines	1925	41	13,296	21,142,430	11,165,658	98,382,910	87,218,252
	1923	*37*	*14,971*	*22,775,197*	*12,483,128*	*95,105,570*	*82,622,442*
Electrical machinery, apparatus and supplies	1925	1,739	239,921	323,834,541	636,692,076	1,540,002,041	903,309,965
	1923	*1,671*	*234,892*	*305,455,263*	*548,626,673*	*1,293,001,771*	*744,375,098*
Engines and waterwheels	1925	220	51,099	73,584,921	145,783,687	313,587,851	167,804,164
	1923	*249*	*48,495*	*70,877,950*	*124,543,051*	*266,997,778*	*142,454,727*
Foundry and machine-shop products, not elsewhere classified	1925	8,154	397,838	590,801,237	883,708,235	2,232,985,974	1,349,277,739
	1923	*8,531*	*448,777*	*642,431,394*	*936,231,003*	*2,337,072,775*	*1,400,841,772*
Gas machines and gas and water meters	1925	61	5,514	7,428,842	13,038,272	34,292,059	21,253,787
	1923	*61*	*6,127*	*7,756,779*	*14,331,863*	*34,250,414*	*19,918,551*
Metal-working machinery (including machine tools) (c)	1925	378	36,825	55,931,810	54,524,362	175,592,488	121,068,126
	1923	*350*	*33,373*	*47,336,800*	*40,977,024*	*137,206,098*	*96,229,074*
Pumps (hand and power) and pumping equipment	1925	253	17,935	25,278,060	50,328,435	120,148,157	69,819,722
	1923	*229*	*14,550*	*19,990,603*	*34,464,720*	*92,930,056*	*58,465,336*
Scales and balances	1925	71	4,292	5,782,660	7,348,704	27,237,181	19,888,477
	1923	*65*	*4,245*	*5,500,035*	*6,594,483*	*24,156,982*	*17,562,499*
Sewing machines, cases and attachments	1925	41	12,121	16,099,725	18,609,724	46,298,336	27,688,612
	1923	*40*	*13,435*	*17,605,201*	*17,763,532*	*45,967,282*	*28,203,750*
Textile machinery and parts	1925	379	27,869	37,463,681	39,036,868	121,653,324	82,616,456
	1923	*428*	*35,672*	*46,022,545*	*49,705,554*	*140,661,358*	*90,935,804*
Typewriters and supplies	1925	70	14,969	18,803,506	15,157,092	63,079,602	47,922,510
	1923	*73*	*14,963*	*18,210,199*	*13,977,459*	*52,498,401*	*38,520,945*
Washing machines and clothes wringers (d)	1925	82	7,077	9,989,875	32,743,312	69,568,206	36,824,894
	1923	*85*	*6,144*	*7,839,171*	*25,741,775*	*50,372,516*	*24,630,741*
Windmills and windmill towers	1925	15	1,391	1,830,232	3,375,582	7,984,005	4,608,423
	1923	*16*	*1,101*	*1,430,971*	*2,592,015*	*6,311,038*	*3,719,023*

(a) Not including salaried employees.
(b) Value of products less cost of materials; in other words, the value created by the manufacturing processes. The cost of materials does *not* include wages, salaries, nor certain other items of expense.
(c) Figures for 1923 not strictly comparable with those for 1925, because of changes in classification.
(d) Not for use in commercial laundries.

Oxygen Existing in Pig and Cast Iron

German Tests Give New Light on an Old Problem—Effect of Temperatures and Operating Practice—New Method of Analysis for Oxygen

A TIMELY article by Professors Oberhoffer and Piwowarsky, on the presence of oxygen in pig irons and cast iron, is published in *Stahl und Eisen*, March 31, 1927, page 521. It summarizes an extensive research on the subject and calls attention to errors made previously in similar investigations.

More Oxygen in Iron Borings

At the very outset, the statement is made, and perfectly understandable by those familiar with cast iron borings, that from the nature of the borings as usually made, the subdivision of the graphite particles—with the well-known property of graphite to adsorb air—leads to oxygen results found by analysis which are two to three times as large as actually present in the metal.

Sampling is therefore a most important consideration in this connection, and the new method developed in the analysis of pig iron and cast iron for oxygen content, at the research laboratory of the Iron and Steel Institute laboratory at Aix-la-Chapelle, in which substantial chips of iron are used in place of fine borings proves this contention. Pig irons, in which the oxygen content found by way of borings averaged 0.072 per cent, were found to contain only 0.025 per cent of this element when small pieces of solid metal were used as a sample. The new method, by the way, has been tested out sufficiently to give concordant results which also correspond more nearly to an expected oxygen content in the metal as based upon operative observation.

Finely Divided Graphite Not Due to Oxygen

Further, the higher oxygen content in irons reported by various observers, using borings for their tests, as resulting in a better distribution of very finely divided graphite, was doubtless not the cause of this condition—the fine graphite being due to higher degrees of superheat applied, as shown by Professor Piwowrasky in his studies on that subject—but the adsorption of air by the fine graphite of the samples.

Johnson's theory of beneficiating pig and cast iron by oxygen is held by the writers of the paper as based upon wrong premises. The results obtained with the new method gave a range of 0.010 to 0.035 per cent oxygen for pig irons, and 0.025 to 0.060 per cent for cast irons, which exceeded those found by Eckman and Jominy (United States Bureau of Standards) who used a high frequency electric furnace and got a maximum of only 0.015 per cent oxygen from his samples.

Plans of Extensive Tests Made

To get more light on the subject, it was decided to conduct a series of tests on pig and cast irons, determining their oxygen content and studying the characteristics of their production in conjunction therewith. For the analytical determinations a 10-gram sample was used consisting of several pieces of roughly equal size and shape. The container in the heating tube was of Berlin porcelain "D4a" material, the temperature 2200 deg. Fahr. and the time 30 min. The gas volume obtained was corrected by subtracting the result of blank determinations.

Three pages of tables on the results from coke pig irons are given, the data consisting of columns for the identification and use of the pig irons, the blast furnace dimensions, blast items of temperature, pressure, etc. Then the burdens in great detail, the analysis of the irons, fracture appearance, the composition of the slags, and finally the average oxygen found for each brand of the 20 coke irons investigated.

Blast Temperature Has No Effect on Oxygen Content

The oxygen content in the above irons varied from 0.012 to 0.036 per cent, averaging 0.022 per cent. The relation of the oxygen content to the manner of running the furnaces could not be judged from the results, and it would take many more determinations to do this. The blast temperature did not seem to affect the oxygen content at all; neither did the analysis of the irons. Expectations that the burden and the slag compositions would throw light were also disappointing, for the expected did not always happen, and when it was thought that a line was had on which to base conclusions, other results destroyed the basis. Attention was then directed to Swedish charcoal irons, which ran from 0.012 to 0.033 per cent in oxygen, averaging 0.023 per cent. Six pages of similar data are given for the charcoal irons.

Swedish Furnaces Are Uniform

While the furnaces of Sweden are very uniform in size, construction and operation, yet even here no relation between oxygen content and operating details could be detected—except that it was noticed that when the silicon went up, giving grayer fracture irons, the oxygen content went up also. The strictly white pig irons averaged 0.015; the mottled, 0.021, and the gray pig irons averaged 0.028 per cent in oxygen. It is patent, therefore, that silicon may have some influence upon the oxygen content. Since, however, it might be thought that in spite of using larger pieces of metal some air absorption may have taken place by surface graphite, a special series of tests was made in which the continuity of the heating under vacuum was interrupted repeatedly to get a line on the flow of the gas from the samples. Incidentally this gives an idea of the method employed, which seems to consist in heating the solid pieces of iron under a temperature of 2200 deg. Fahr. and applying a vacuum to draw out the gases for collection, measurement and determination of the oxygen content.

Silicon Content Affects Oxygen Percentage

The result of this series of tests indicated that there had been no appreciable adsorption of air, and that, therefore, the silicon content did have some effect on the oxygen percentages found. It now remained to find out in what form the oxygen was present.

Passing over the arguments advanced as to what could not happen, the investigation finally resulted in showing that much of the oxygen was due to an increase of silica contained in the iron. The method by bromine was used to fix the proportion of silica in the insoluble residue found after the removal of the iron itself from the samples. The averages show that this residue, other than iron, amounted to 0.036 per cent, the oxygen content averaged 0.022, and of this 0.018 per cent was contained in the silica. The puzzling thing, however, is that this condition cannot be proved for the coke pig irons. It may be that the comparatively lower temperatures of the crucible of the charcoal iron furnace will not allow the complete reduction of silica to silicon in the iron as is the case with the much hotter coke irons.

Oxygen Higher in Cast Irons

Tests made with cast irons show that the oxygen content is unquestionably higher here. This is the natural outcome of contact with oxidizing gases in the melting zone of the cupola. Of 29 samples, three might

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Abstracted, with comments, by Dr. Richard Moldenke, Watchung, N. J.

be disregarded as running exceptionally high in oxygen —up to 0.059 per cent. This would leave the other 26 as running from 0.0207 to 0.047 per cent, with an average of 0.0345 per cent in oxygen. Just as in the pig irons, the relation between chemical composition as a whole and the oxygen itself is not clear. Still, the silicon content of the series running from 0.5 to 2.4 per cent in silicon gave an oxygen content running similarly from 0.030 to 0.044 per cent. It was further found that while oxygen at 0.035 per cent did not materially affect the quality of the iron, a percentage of 0.045 did begin to show inferior metal, and above this the iron is actually bad.

Good Cast Iron with High Blast Volume

One very interesting result of the investigation on cast irons is that with very high blast volumes—greater than the normal ones now used in cupola practice—very good metal resulted. Even 3 to 4 per cent oxygen added to the blast showed no increase in the oxygen content of the resulting metal. It seems that any operation, tending to increase the superheat considerably, helps a reduction of the oxygen content—thereby bearing out the observation of foundrymen that a very hot iron from the cupola is better than a cold one.

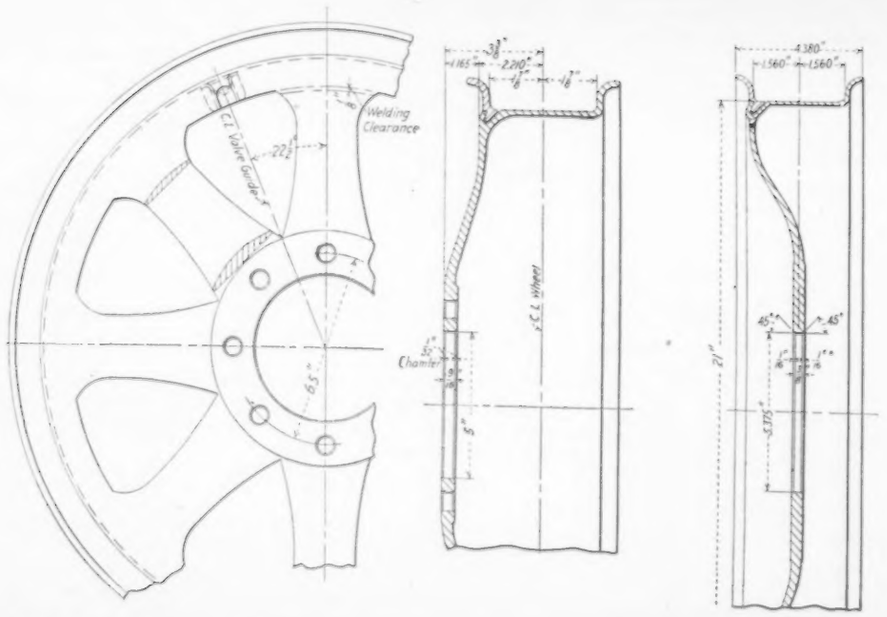
It may be of further interest that in the new method for determining oxygen—by the extraction of all the gases under high heat and vacuum—the oxygen content of the gases is highest in charcoal pig irons, next in coke pig irons and least in cast iron, the volume percentages being 36.2, 29.7 and 21.6 respectively. Nitrogen was not determined specifically, but taken by difference.

The result of the whole investigation shows that, so far as the foundryman is concerned, his salvation with the pig irons made as they are lies in melting extremely hot, so that whatever oxygen is picked up above a final safe limit of 0.035 per cent in his castings, may be removed by the deoxidizing effect allowed by the high temperatures attained.

The equipment of the Penn Mold & Mfg. Co. is to be moved from Dover, Ohio, to Sharpsville, Pa., the property having been purchased by the Sharpsville Furnace Co. Manufacturing operations will be continued at Sharpsville.

Pressed Steel Automobile Wheels

SOME of the forms of steel wheels for automobiles and trucks now being made by Whitehead & Kales, Detroit, are the subject of the accompanying illustrations received from A. L. Putnam of that company, formerly identified with the Disteel wheel. As may be seen from the drawings, there are several types of construction used, depending upon the load to be carried. It will be noted that the section at the right has one more member than that at the left.



Above Are Shown Two Uses of Steel Wheels—for Trucks and Touring Cars. Those given in the photographs represent different types of wheels, designed for the particular loads carried

(At Left) Several Forms of the New Steel Wheel Have Been Developed. Two are shown in the drawings, the one at left being apparently the same as in the front wheels of the truck above. The shape provides natural flexibility

Possibilities of Fuel Economy

Suggests Improvements in Iron and Steel Industry— Germans Lead in Heat-Saving Refinements —Gas Enrichment Proposed

BY H. A. BRASSERT*

CONSUMPTION of bituminous coal annually by the American iron and steel industry is approximately 115,000,000 tons, or 20 per cent of the country's production. Most of this is completely gasified, either in gas prodducers or in coke ovens, by high-temperature distillation and subsequent burning of the coke in blast furnaces or cupolas. A relatively small amount is fired as coal under boilers or for other purposes. Since the consumption of bituminous coal and the production of gas therefrom have reached larger proportions in this industry than in any other, any economies in their use here are of far-reaching importance. At most iron and steel plants the opportunity for substantial fuel savings exists, especially by more efficient and more complete use of surplus gases and waste heat.

Recent Improvements in Use of Fuel

Higher freight rates and other factors have made stricter fuel economy almost compulsory. Much progress in the economical use of fuel has lately been made, as exemplified by the widespread application of automatic combustion control, resulting in better hot-blast stove, boiler and heating furnace practice; the installation of much larger boilers designed for high steam pressures and superheats, and of bigger electric power generating units located in central stations; also, the more complete use of coke oven gas, more general application of mechanical producers and other improvements.

Heat Economy at German Iron and Steel Plants

Comparing the heat economy as practised in Germany with that prevailing in the best American plants, the greatest difference lies in the widespread use of the gas engine in the former country, both for blowing and power generation. This results in a greater percentage of surplus gas becoming available, and the complete utilization of this much greater amount of surplus blast furnace gas in German steel works and mills. They have progressed further in refinements of stove, gas engine and heating practice, as well as in the use of finely cleaned gas for all purposes. American plants, on the other hand, have gone further in the application of large boiler and turbine units.

Several steel plants in Germany, in spite of producing both open-hearth and basic Bessemer steel and a wide range of products, normally consume no coal in the production of finished steel beyond that charged into the coke ovens, excepting locomotive fuel. Even this is often eliminated by the use of electric or compressed air switch engines. At other plants coal is fired only to generate power for sale, or to replace coke oven gas sold to communities on account of its higher value.

There is no fuel practice in this country comparing with this achievement, even at plants where gas engines are the prime movers. It should be stated, however, that most of the German plants have the advantage of producing a much larger percentage of their steel in the Bessemer converter, about one-third of the German steel still being made by the basic Bessemer process. Also in American mill practice a much larger percentage of the steel is reheated after blooming than in German plants.

Proper Application of Blast Furnace and Coke Oven Gas

From the viewpoint of ultimate economy, steel plants should be guided by the principle that blast furnace and coke oven gas should be applied primarily to all uses where a solid fuel cannot be utilized, and then to where solid fuel can give equally good or even better results, especially under boilers.

It is disadvantageous to fire blast furnace or coke oven gas under boilers, where coke breeze and cheaper grades of coal applied in the powdered form or on efficient stokers would give excellent efficiency, and at the same time to gasify a more expensive coal for use in heating furnaces, for which purpose blast furnace and coke oven gas could be used to greater advantage. It should always be remembered that the use of blast furnace and coke oven gas for melting and heating saves the cost of gasifying an equivalent amount of high-priced coal in the producer.

Economic Value of Blast Furnace Gas

While the great commercial value of surplus coke oven gas has been fully realized, that of blast furnace gas has not been generally appreciated. A few figures, therefore, may be of interest. The coking coal used annually in American coke ovens, amounting to say 80,000,000 tons, contains a volume of coal gas released by high-temperature distillation aggregating in heat value 448,000 billion B.t.u., equivalent to 17,200,000 tons of coal. Of this gas, approximately 20 per cent is still being wasted through the use of beehive ovens. A considerable percentage of the remainder is lost through inability to utilize the whole of the gas at all times, more particularly the week-end gas.

Blast furnace gas represents even a larger total heat value than coke oven gas. For each ton of pig iron made, an average of approximately 140,000 cu. ft. of blast furnace gas is produced. At 94 B.t.u. per cu. ft. this represents an output of 13,160,000 B.t.u. per ton of iron. In an annual production of 36,000,000 tons of iron, 473,760 billion B.t.u. are produced, equivalent to 18,220,000 tons of coal. Since this tonnage is more than the total coal equivalent of the annual coke oven gas production, it suggests strongly the great economic importance of utilizing in the most efficient manner the highest possible percentage of the blast furnace gas.

Economics of the Blast Furnace as a Gas Producer

On the other hand, the mistake has been made of considering the gas producer function of the blast furnace as of such importance as to condone high coke consumption per ton of iron. Both here and abroad there have been cases where, through the use of gas engines or of very cheap coke, the returns from surplus gas were unusually high and seemed to offset the cost

*Consulting engineer, Chicago. This is an abstract of a paper read before the Eastern States Blast Furnace and Coke Oven Association, at the winter meeting held at Pittsburgh, March 4. It covers almost the same ground as a previous paper, by the same author, read last November at the International Conference on Bituminous Coal, held also at Pittsburgh.

of a higher coke consumption. The blast furnace is essentially designed for reducing and smelting iron ores, and is not an efficient gas producer.

From the results of experiments made some years ago, the author became convinced that a blast furnace is not a suitable apparatus for making gas as its main product. It is more economical to operate it in accordance with its best efficiency as a reducing and smelting unit, and to produce excess gas needed for the steel plant from coal direct, by means and apparatus specifically designed to perform this duty. Slagging producers have been designed for this purpose, but the development in cheap gas production will likely be in another direction, since it will be difficult to overcome the loss of the sensible heat in the slag.

There seems no probability in this country of any substantial decrease in the cost of gas engines, due to quantity production and standardization and the only possibility for a cheaper gas power unit is the gas turbine. In Germany the gas engine has a low initial cost, is operated with low-priced labor and has been further developed than here, not only in regard to size of units but particularly in that the waste heat, both in exhaust gases and in cooling water, is fully utilized.

Whereas a heat efficiency of 21 to 24 per cent is attained in this country on average plant performance, German gas engine stations are usually operating with fuel efficiencies of 26 to 30 per cent, and in some cases efficiencies of 33 per cent have been attained. They are generally equipped with scavenging and surcharging arrangements which permit an increase in the horsepower output without loss in overall thermal efficiency, because waste-heat boilers are installed and the heat in the cooling water is recovered for boiler feed or other uses.

Enriched Blast Furnace Gas

For melting steel in the open-hearth furnace, blast furnace gas has too low a heat value and is too high in nitrogen. For this and other high-temperature work it must be enriched. This can be done either by mixing a certain amount of coke oven gas, tar or oil with it or by passing it through a producer.

At many works abroad, and at one plant in this country, blast furnace gas and coke oven gas are mixed together. For use in open-hearth furnaces, some oil or tar is usually added. The general practice is to maintain the B.t.u. content in the mixture within the range where the gas does not have to be regenerated. This mixed gas then is available for all purposes throughout the steel works and rolling mills, and also for coke ovens equipped for air regeneration only.

Enriching Blast Furnace Gas in Producers or Water Gas Generators

George R. McDermott read a paper in May, 1925, before the Association of Iron and Steel Electrical Engineers, on blowing gas producers with blast furnace gas. He gave the results attained by blowing air and blast furnace gas alternately up through a hand-poked producer. Using coal, he reported a B.t.u. value of 195.2 when blowing with gas, as against 121 when blowing with air, the average gas during the test of 4 hr. containing 147.3 B.t.u. As these results are of the greatest interest, the analysis of the resultant gas in each case and of the mixture are herewith given.

	Combined Gas, Per Cent	Gas Blow Period. Per Cent	Air Blow Period. Per Cent
CO_2	4.7	3.3	6.0
C_2H_4	0.7	1.0	0.5
H_2	7.2	10.2	6.0
CO	29.6	35.4	23.4
CH_4	2.4	4.2	2.4
B.t.u. low value	147.3	195.2	121.0

Efficiency of Open-Hearth Process

The open-hearth furnace at present is thermally inefficient. Fred Clements gives its thermal efficiency as 16.98 per cent, without waste-heat boilers. This figure is higher than some given by American open-hearth plants. Kinney and McDermott, in their paper read before the American Iron and Steel Institute in 1922, gave a thermal efficiency of 14.24 per cent for 1912 and 15.8 per cent for 1922. Dr. G. Bulle gives the efficiency of the process in German plants operating on scrap as 20 to 30 per cent, on pig iron and ore as 10 to 20 per cent and of the Talbot process as 2 to 5 per cent.

By recent developments higher efficiencies have been obtained through better methods of open-hearth design, causing better flame control. The improvement in fuel efficiency has been coupled with larger production and longer life of the furnace. The application of waste-heat boilers has recovered from 10 to 20 per cent of the total heat—16.4 per cent according to Kinney and McDermott.

Ideal Fuel Program for Steel Plants

The ideal condition would appear to be the sale of all of the coal gas from high and low temperature distillation, for it is in the field of high-divided distribution and use that this high-thermal gas must seek its full value. It seems an economic waste to use it in the larger furnace units of a steel plant, if it can be sold to households and small industries. This program also saves all of the week-end and holiday coke oven gas and most of the blast furnace gas. Unmixed blast furnace gas should be applied to stoves, gas engines, coke ovens and heating furnaces not requiring high temperatures, and in which this sulphur-free gas is of special benefit. Steam should be generated from coke breeze and low-grade coal.

For melting and high-temperature heating of steel a special gas should be produced in a central gas plant, preferably by the cycle method of operation; in the generation of such gas, sulphur blast furnace gas and undersized coke may be used. This new gas for melting should be low in sulphur, of the highest possible heat value and still capable of regeneration without appreciable dissociation of its constituents. This gas will give higher flame temperatures than have heretofore been reached. The resulting higher head of heat will lead to better efficiency of the process and increased output, and will meet the growing demand for quality steel.

Steel Corporation's Research Department Head Visits Birmingham

BIRMINGHAM, July 11.—That laboratories will be established in central sections for undertaking the work assigned to the new department of research and technology, established by the United States Steel Corporation, and that some thirty or more engineers, chemists and others will be employed constantly in the work, are plans under consideration by Dr. John Johnston, formerly of Yale, who was named to head the department. Dr. Johnston together with Dr. F. B. Jewett, vice-president of the Bell Laboratories and for many years with the General Electric, Western Electric and Bell Telephone companies, spent the past week in the Birmingham district, being shown around by President George Gordon Crawford and Vice-President and General Manager H. C. Ryding of the Tennessee Coal, Iron & Railroad Co. This was the first visit to the Birmingham district by Dr. Johnston. Dr. Jewett, Mr. Crawford, Dr. R. A. Millikan, Pasadena, Cal., and Dr. Johnston constitute the executive council of the research department.

Contend Crop Ends Take Billet Rate

WASHINGTON, July 12.—A complaint has been filed with the Interstate Commerce Commission by the Carnegie Steel Co. and the Illinois Steel Co., seeking reparation of $2,800, together with interest, from railroads which, they allege, charged the rates applicable to bar iron and steel on crop ends that were shipped with round-cornered square billets. It is claimed that the tariff provisions call for the same rate on the crop ends as on the billets, instead of the higher rates that apply to iron or steel bars.

Agree Upon Heat Treatment Terms

Committee from Three Technical Societies Recommends Terms for Steel Treatment—Adopted as Tentative by Testing Society

AFTER six years of negotiations among three important technical societies and particularly as a result of the work of a special committee appointed three years ago, an agreement has been reached as to the proper definitions for terms relating to heat treatment operations. The three societies and their representatives, which formulated these definitions, were as follows: For the American Society for Testing Materials, John H. Hall, Prof. H. M. Boylston and Dr. G. B. Waterhouse; for the Society of Automotive Engineers, George L. Norris, Stanley P. Rockwell and Dr. John A. Mathews; for the American Society for Steel Treating, J. Fletcher Harper, W. J. Merton and Prof. Bradley Stoughton. The secretary of the committee was J. Edward Donnellan of the American Society for Steel Treating.

The tentative definitions, as relating particularly to the ferrous alloys, were adopted as tentative by the American Society for Testing Materials at its annual convention at French Lick, Ind., the week of June 20. The definitions as recommended for adoption are as follows:

In preparing the definitions included herein, the terms have been so defined, as most in keeping with present-day usage, that they shall mean definite operations and shall not be considered as referring to the resultant structures or general conditions.

By "critical temperature range," as used in the definitions, is meant that temperature range illustrated by the following Fig. 1, taken from Howe:

Heat Treatment.—An operation or combination of operations involving the heating and cooling of a metal or an alloy in the solid state.

Note.—This is for the purpose of obtaining certain desirable conditions or properties. Heating and cooling for the sole purpose of mechanical working are excluded from the meaning of this definition.

Quenching.—Immersing to cool.

Note.—Immersion may be in liquids, gases or solids.

Hardening.—Heating and quenching certain iron-base alloys from a temperature either within or above the critical temperature range.

Annealing.—Annealing is a heating and cooling operation of a material in the solid state.

Note 1.—Annealing usually implies a relatively slow cooling.

Note 2.—Annealing is a comprehensive term. The purpose of such a heat treatment may be:

(a) To remove stresses.

(b) To induce softness.

(c) To alter ductility, toughness, electrical, magnetic or other physical properties.

(d) To refine the crystalline structure.

(e) To remove gases.

In annealing, the temperature of the operation and the rate of cooling depend upon the material being heat treated and the purpose of the treatment.

Certain specific heat treatments coming under the comprehensive term "annealing" are:

Normalizing.—Heating iron-base alloys above the critical temperature range, followed by cooling to below that range in still air at ordinary temperature.

Note.—In the case of hyper-eutectoid steel, it is often desirable to heat above the Ac_{cm} line, as shown in Fig. 2.

Spheroidizing.—Prolonged heating of iron-base alloys at a temperature in the neighborhood of, but generally slightly below, the critical temperature range, usually followed by relatively slow cooling.

Note 1.—In the case of small objects of high-carbon steels, the spheroidizing result is achieved more rapidly by prolonged heating to temperatures alternately within and slightly below the critical temperature range.

Note 2.—The object of this heat treatment is to produce a globular condition of the carbide.

Tempering (also termed Drawing).—Reheating after hardening, to some temperature below the critical temperature range, followed by any rate of cooling.

Note 1.—Although the terms "tempering" and "drawing" are practically synonymous as used in commercial practice, the term "tempering" is preferred.

Note 2.—Tempering meaning the operation of hardening followed by reheating is a usage which is illogical and confusing in the present state of the art of heat treating and should be discouraged.

Malleablizing.—Malleablizing is a type of annealing operation with slow cooling whereby combined carbon in white cast iron is transformed to temper carbon and in some cases the carbon is entirely removed from the iron.

Note.—Temper carbon is free carbon in the form of rounded nodules made up of an aggregate of minute crystals.

Graphitizing.—Graphitizing is a type of annealing of cast iron whereby some or all of the combined carbon is transformed to free or uncombined carbon.

Carburizing (Cementation).—Adding carbon to iron-base alloys by heating the metal below its melting point in contact with carbonaceous material.

Note.—The term "carbonizing" used in this sense is undesirable and its use should be discouraged.

Case Hardening.—Carburizing and subsequently hardening by suitable heat treatment, all or part of the surface portions of a piece of iron-base alloy.

Case.—That portion of a carburized iron-base alloy article in which the carbon content has been substantially increased.

Core.—That portion of a carburized iron-base alloy article in which the carbon content has not been substantially increased.

Note.—The terms "case" and "core" apply both to carburizing and case-hardening.

Cyaniding.—Surface hardening of an iron-base alloy article or portion of it by heating at a suitable temperature in contact with a cyanide salt, followed by quenching.

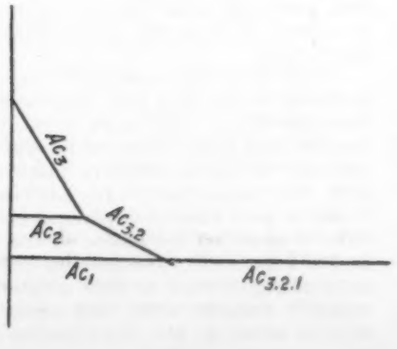


Fig. 1—Critical Temperature Range for Heat Treatment of Steel

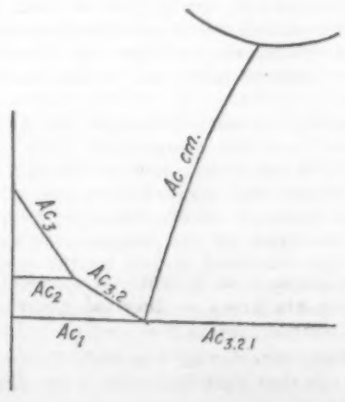


Fig. 2—The Ac_{cm} Line in Hyper-eutectoid Steel

Research Requires Money and Men

Speakers at Institute of Chemistry Meeting Emphasize Ultimate Profits to Be Derived in Industrial Field

INDUSTRIAL research, its cost, its value, and its personnel, was discussed at meetings held July 6, by the Institute of Chemistry at Pennsylvania State College, State College, Pa.

Research was defined as "Scientific Experimenting to Establish and Coordinate Facts," by Dr. L. V. Redman, vice-president General Bakelite Corporation. He further characterized it as the greatest gamble in the world for an individual, but the surest thing in the world when spread over the whole nation.

"Purely scientific research may be revolutionary, may produce enormous wealth for the world, but it will not necessarily do it in two, three or five years. One can well imagine that a research eliminating tuberculosis, which kills every seventh person in the United States, would be one of the most profitable things the United States could do, but one cannot do it and establish sanitariums and have it on a paying basis in two or three years. Purely scientific work will pay a country enormously but no private concern for private gain can hope to undertake it.

"Practical research has only one type of support and that is money that is wanting and clamoring for immediate return. Pure science has no immediate time function and for that reason is probably the happier. Practical research, on the other hand, will not wait for dividends longer than three, five or at most eight or nine years. If a longer time is demanded the courage of the one placing his money will grow less and less and the effort may fail from want of financial support.

"In casting about for financial support for doing practical research there are three sources.

"First, your own financial support, carried on for yourself (such as Goodyear did and which all too often leads to the tragic hardships he had to pass through). Some men have made good—defining 'good' as making a fortune—under these conditions. McCormick with his farm implements is one.

"The second type of support is that of assistance of private fortunes, such as Eli Whitney had in producing the cotton gin. You will recall that his classmate from Yale, Miller, had married the widow of General Greene of Revolutionary fame and by this marriage the fortune of Greene was made available for Whitney's experiments.

"The third and most common form of financing is for the research and development to be paid for by existing corporations, and this is the common method in use in America today.

"The real shamble the researcher gets into comes after his research is done. Assuming he has been successful as a researcher, he is only going into the battle that will defeat him. If his research is successful it will take ten times the amount of money it cost to develop his ideas. If then the development is successful, it will very probably take ten times that amount of money to make it commercial, so that the ten thousand dollar research needs one hundred thousand dollars for development and the one hundred thousand dollar development needs one million dollars for manufacturing.

"It is this constantly increasing demand on capital which is the Waterloo of the researcher. Not only does he require $10,000 for research, $100,000 for development and $1,000,000 for manufacture, but if he is pressing his work through an organization, it very probably will have to write off for obsolescence some factory which has been rendered useless by the invention, and it is with considerable timidity that any board of directors approaches the question of throwing one plant into obsolescence for another."

Dr. C. E. K. Mees, director of research Eastman Kodak Co., pointed out that such research is the thing that prevents depreciation in the intangible assets of a corporation and its cost should be carried, not as a capital charge, but as a current expense. "Research is insurance against obsolescence of industrial methods. It prevents processes from getting out of date.

"There are three types of research carried on by industrial firms. The first looks for ultimate but not immediate results. The second has to do with development of operating processes, and the third is directed to service. The first two are proper depreciation expenses. The last is a definite current expense. Long time research makes money for a concern. Research is like panning gold from a stream. One lives from the gold dust one collects but always seeks nuggets. These nuggets of research are the result of what I call long time research."

Dr. Charles H. Herty, past president of the American Chemical Society, said that industrial research is threatened with curtailment since the demand for qualified men outstrips the ability of our universities to furnish them.

"Sixteen years ago the American business man knew little or nothing about industrial research," said Dr. Herty, "but today the need for it has been impressed upon men all over the country in all lines of business and there is a question of curtailing industrial research to fit the men available. There is a very real danger in this unless it is met by pushing forward the education of young men qualified to undertake such work. Education must broaden the understanding and deepen the grasp of young men to fit them to carry on. More must be done in the universities, and graduate departments must actively encourage men of high mentality to go further. No brakes must be placed upon research but rather every encouragement must be offered to young men to fit themselves to carry on.

"Government laboratories are not the place for industrial research, but for investigations in fundamental science from which the people of the nation may profit greatly but from which the individual will profit only incidentally."

Stimulus Given to Commercial Aviation

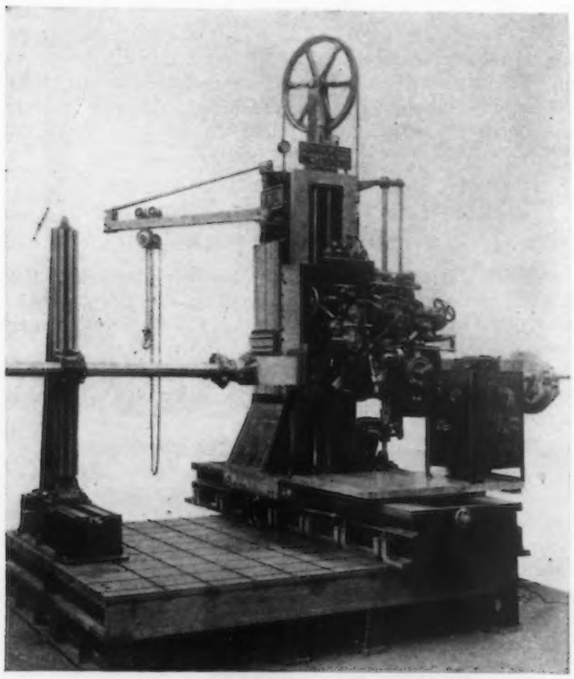
WASHINGTON, July 12.—The great stimulus that has been given to commercial aviation by trans-Atlantic and trans-Pacific flights has been reflected in many ways, such as the proposal of railroads to institute air service as supplementary to their rail service. So great has become demands for pilot licenses, inspection and registration of aircraft that William P. MacCracken, Jr., assistant secretary for aeronautics, Department of Commerce, has announced the appointment of Clarence N. Young, Des Moines, Iowa, as director of the aeronautics branch of the department. Mr. Young will supervise the work of the entire branch and act as first assistant to Mr. MacCracken. He was originally appointed chief of the air regulations division, in October, 1926.

That the newly completed branch will be active is indicated by the fact that approximately 2100 applications for licenses as pilot, 1600 applications for inspection and registration of aircraft and 2000 applications for license as airplane mechanic are now on file with the department. In addition, Secretary MacCracken said that an increasingly large number of cities is applying for advice on the location and operation of airports. Appointment of Mr. Young will permit more timely service to civil aviators, aircraft and accessories manufacturers and others interested in commercial aviation, Mr. MacCracken said.

New 60-In. Stroke Traveling-Head Planer

A number of machining operations, such as planing, milling, boring, drilling, vertica' milling and right-angle boring may be performed at one setting on the 60-in. stroke draw-cut traveling-head planer here illustrated, which has been brought out by the Morton Mfg. Co., Muskegon Heights, Mich.

The machine is adapted for the complete machining of rolling mill housings, engine beds and other large castings. The horizontal travel on the bed is 9 ft., and



Draw-Cut Traveling Head Planer for Machining Rolling Mill Housings and Other Large Castings

the vertical travel on the column is 5 ft. The machine is available with various heights of column and lengths of bed and can be furnished also without the boring, milling and drilling features for shaping and planing operations. It can be used either as a stationary or portable unit, and can be converted conveniently into a traveling-head slotter.

Milling and boring feeds are automatic and may be changed conveniently. They are controlled by one lever. The feed gear box gives eight changes in each direction. The milling and boring attachment is provided with a hollow-steel arbor which passes through the ram and is suitably journaled. The arbor is bored for receiving taper shank milling cutters, boring bars and other special equipment. When planing or shaping the machine will automatically feed horizontally on the bed, or vertically on the column.

When using a reversing motor drive, the power is transmitted through miter gearing and a vertical shaft to the operating mechanism contained in the vertically moving apron. This arrangement is stressed as eliminating the reversing clutches necessary when using direct current motor drive.

Bearings Company Expands

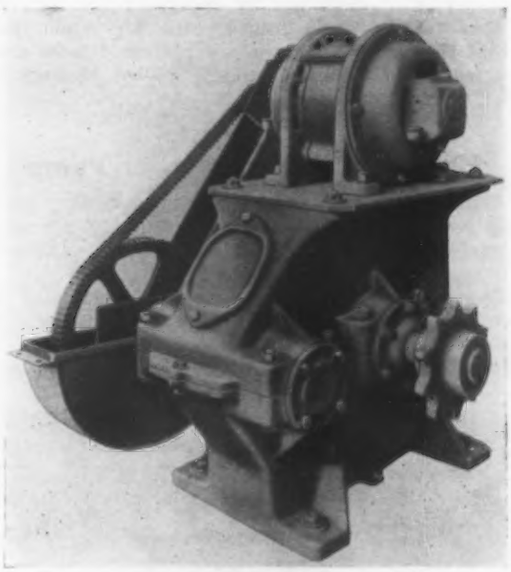
The Bearings Co. of America, Lancaster, Pa., is constructing plant additions that will increase its production capacity 50 per cent. Three new buildings, one, 40 x 150 ft., another, 94 x 100 ft., and a third, 100 x 130 ft., are being erected. The foundations and walls are completed, and the rest of the work is scheduled to be finished in the near future. Precision machinery will be installed. The expansion of plant facilities is being made to increase the company's output of thrust and angular contact bearings and retainers, to meet demands, especially from the automotive industry.

Self-Contained Speed Reducer for Varied Applications

The H. W. Caldwell & Son Co., Western Avenue and Seventeenth Street, Chicago, has placed on the market the speed reducer here illustrated, which is available in two types, one for general industrial application and the other for screw conveyor service.

Each reducer is a compact, self-contained unit, entirely inclosed, and has the driving motor on top of the housing, as shown. It is a combination of two separate drives: Link-Belt silent chain drive from the high-speed shaft, and a cut spur gear drive to the low-speed shaft. The device is available in sizes to furnish ratios from 7 to 1 up to 40 to 1 in the type A, or industrial service unit, or 30 to 1 in the type B or screw conveyor unit.

The silent chain drive from the motor is claimed to provide a flexible, positive and efficient drive for the high-speed reduction, eliminating the necessity of a flexible coupling on the motor shaft. The silent chain drive is entirely inclosed in an oil retaining casing. The cast-iron housing of the device is of rugged construction, and is arranged to prevent oil leakage, and to exclude dust and dirt from the working parts. It has a large handhole for inspection purposes. The spur gears run in an oil bath, and are said to operate without noise or vibration. The upper part of the housing can be separated from the lower part without disturbing the mounting of the motor. Timken tapered roller bearings, carried in cartridge mountings, support the shafts and outboard bearings are unnecessary. It



The Silent Chain Drive From the Motor Is Flexible and Positive. The spur gears run at low speeds, without noise or vibration, in an oil bath

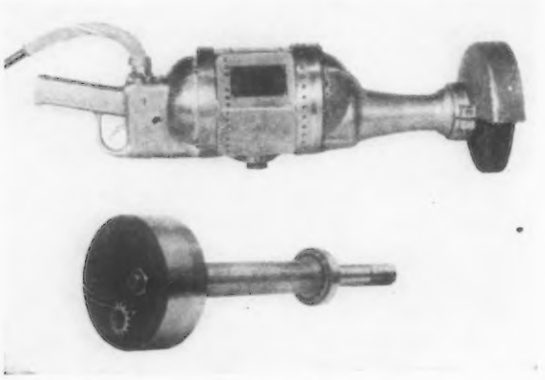
is claimed that the motor and silent chain drive cannot get out of alinement because they are mounted directly on the housing.

A feature stressed as convenient for users, is that the types and sizes of Link-Belt silent chain drives selected for the various reducers were taken from the standard sizes of chains and wheels carried in stock in industrial centers. This permits of quickly changing speed ratios, by substituting a different size of motor pinion, or of silent chain driven wheel, or both. The type B speed reducer, for driving screw conveyors, is compact and simplifies the framing of the supports for the screw conveyor. Part of the housing of this reducer forms the box-end of the conveyor, and a dust seal is provided in the end adjacent to the conveyor trough, to keep the dust from working into the bearings. The type B reducer is fitted with bronze bushed self-oiling bearings. The general specifications are the same as those for the type A speed reducer, except that the housing is split vertically.

Improves Portable Electric Grinder

Internal gear drive is an improved feature of the 5-in. and 6-in. universal-motored portable electric grinders of the Black & Decker Mfg. Co., Towson, Md. The internal gear drive arrangement reduces the distance of gear centers and, consequently, reduces the diameter of the gear housing.

The lower illustration shows the internal gear together with wheel spindle assembly. It is claimed that



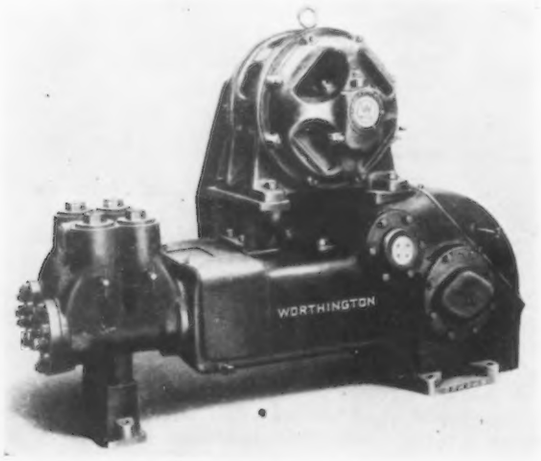
The Internal Gear Drive Permits Reduction in Diameter of Gear Housing

the internal gear is of sturdy construction, and that longer life and smoother operation of the grinder have resulted from this gear design. The wheel spindle is supported at each end by tapered roller bearings. Another feature is in locating the air intake holes so that the motor windings are protected from sharp particles of grit which may be pulled through the motor with the ventilating air.

Horizontal Duplex Power Pump

A fully inclosed horizontal duplex self-oiling power pump with double-acting pistons has been placed on the market by the Worthington Pump & Machinery Corporation, 115 Broadway, New York.

The machine is intended for general service of medium-high pressure within its capacity range. Six sizes are available. Piston diameters range from 2½ to 5 in., the stroke being 10 in. in all cases. Capacities



The Pump Is Fully Inclosed and Is Self-Lubricating. It is intended for general service of medium high pressure

range from 42.5 to 195 U. S. gal. per min., and pressures from 350 to 1400 lb. per sq. in. Although the pumps are built as complete units, power ends can be furnished separately for application to Worthington fluid ends of Snow pot-valve double-acting piston-type steam pumps already in service.

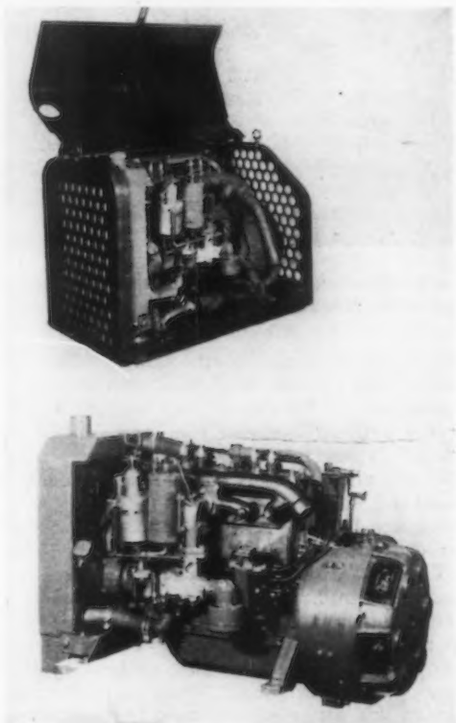
The power end of the pumps is of the horizontal duplex double-acting type having the frame, the crosshead guides and the bearing supports cast integral. The connecting rods and the gearing are located between the main bearings. A separate hood or cover of gray iron makes a dust and oil-tight joint over the crankcase. The inclosed crankcase provides a large oil reservoir. The main gear dips in the lubricant and carries oil to the top of the crankcase, whence it is distributed to all bearings, connecting rods, gearing and crossheads.

The power-end frame is a one-piece casting. The guides and main and pinion-shaft bearings are machined at one setting to assure accurate alinement. The crankshaft is of two-throw type, and the pinion shaft, of carbon steel, is carefully turned and ground. The connecting rods are of steel and are of the marine type. The crank-end bearing is adjustable and is lined with babbitt; the crosshead end is fitted with a removable bronze bearing shell. Crossheads are of large diameter, of gray iron and operate in bored guides, cast integral in the frame.

Gas-Electric Power Plant for Industrial Trucks

A new direct-connected unit has been added to the line of gas-electric industrial truck power plants manufactured by the Ready Power Co., 3820 Grand River Avenue, Detroit.

The new unit consists of a Continental H-9 motor driving an electric generator, the armature of which



The Assembly Is Spring Suspended From the Main Frame at Four Points

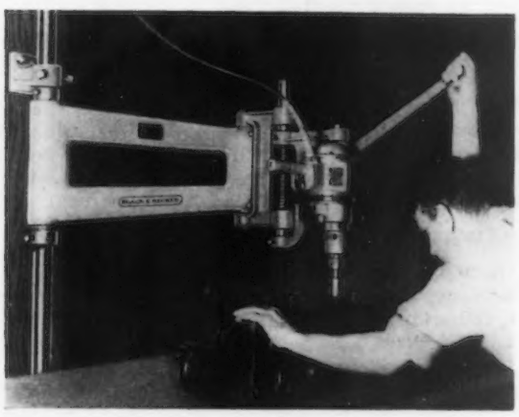
is bolted directly to the crankshaft flange, replacing the flywheel. The lower illustration shows the assembly of the power plant with the steel housing removed. This assembly is spring suspended from the main frame at four points, as shown in the upper illustration, which arrangement is stressed as tending to ease up the jar occasioned by rough floor conditions and to absorb the shock of starting with heavy loads. The various parts of the unit are accessible for adjustment and repair. By turning the unit over on its side, the oil pan may be easily removed, and the exposed main and connecting rod bearings conveniently adjusted. The new unit is cranked from the side, which is an improvement over the company's former models.

Regular equipment includes an oil filter, air cleaner and gasoline strainer. Vacuum fuel system is used, which minimizes the fire hazard due to breakage of gasoline connections. Magneto ignition is employed in connection with an impulse starter.

Radial Arm Facilitates Use of Portable Tools

To facilitate the use of its portable electric tools, particularly the larger sizes of stud setters and nut drivers, the Black & Decker Mfg. Co., Towson, Md., is offering the radial arm shown in the accompanying illustration.

The device is furnished with heavy brackets that bolt or clamp to the wall or a post and serve to support the steel column, which, in turn, carries the arm. The arm may be adjusted 24 in. vertically on the column and may be swung through an arc of 180 deg.



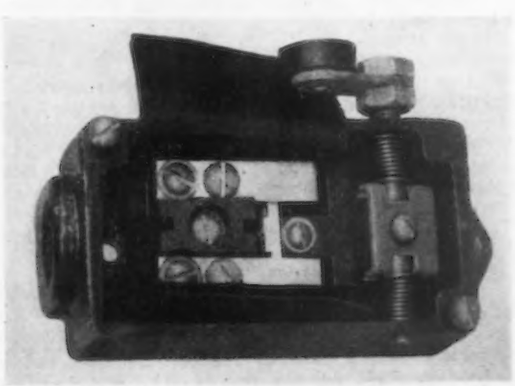
The Arm Facilitates the Use of the Larger Sizes of Stud Setters and Nut Drivers

The distance from the center of the column to the center of the arm joint pin is 22 in.

The drill holder proper is designed to take adapter blocks for any of the company's electric drills, ranging in size from ⅜ in. to ⅞ in. inclusive, and No. 3, No. 4 and No. 41 electric screw drivers or socket wrenches. The drill holder allows a vertical adjustment of 3¾ in. and is operated by a hand lever with a 5 to 1 ratio. It also has an angular adjustment of 245 deg The distance from the center of the arm joint pin to the center of tool spindle is 14 in. A point within radii from 19 in. to 36 in. from the point where radial arm is attached to the wall can be quickly and conveniently reached. The weight of the radial arm is carried by ball thrust bearing on the column.

Small Limit Switch for Machine Tools and Other Equipment

A small limit switch for use in stopping carriages at the end of the travel, and for other applications where a normally open or normally closed contact is required, has been brought out by the General Electric Co., Schenectady.



The Switch Is Arranged for Conduit Connection and Is Dust-Tight

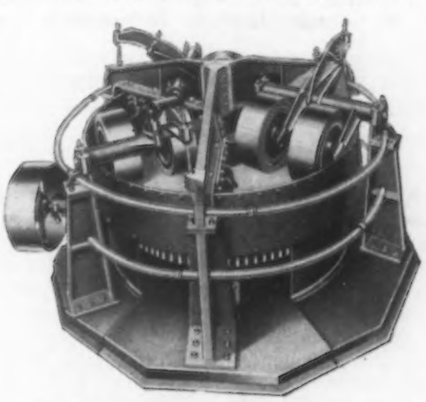
Advantages claimed for the device include: adjustable operating arm; ability to mount the operating arm on either side of the switch; great creepage; and sliding contact. Another feature is the varnished cambric lining which entirely incloses the contacts and terminal screws, thus eliminating any possibility of grounding or short-circuiting from stranded wires left by workmen when connecting the switch. The following ratings are given to cover the switch, providing it is opened approximately ¼ in.; 2 amp. at 125 volts; 1 amp. at 250 volts and 0.4 amp. at 600 volts.

The switch is of cast iron, is arranged for conduit connection and is dust-tight. The contacts may be either normally open or normally closed, although the switch as regularly furnished is normally closed. Change over for normally open operation may be quickly made. The operating arm of the switch can be set conveniently at any angle, and if it is desired to use the operating arm on the other side of the switch, a form can be furnished with the arm mounted on that side.

Sand Mixer for Use in Continuous Handling Systems

Capacity ranging from 60 to 85 tons of sand per hour, depending on the class of sand and the amount of mulling necessary to properly condition the sand, is claimed for the Simpson intensive sand mixer here illustrated, which has been designed by the National Engineering Co., 549 West Washington Boulevard. Chicago.

This machine has a revolving pan, the mullers and plows being stationary. Sand is fed into the machine at the outside of the pan. There are three plow beams each fitted with six plows which can be adjusted or set at any angle to regulate the time the sand is held in the mill. These plows guide the sand under the six 11-in. face mullers, gradually working it to the center



The Plows Guide the Sand Under the Mullers, Gradually Working It to the Center of the Pan

of the pan through which it is discharged on to a belt for distribution.

Substantial construction is a feature stressed. The main drive spur gear is of steel and has cut teeth, and although is takes only approximately 30 hp. to drive the mill, the gear has a safe load of 150 hp. The cut bevel reduction gear runs in oil and is housed in an oil-tight casing. All working parts of the mill are equipped with Timken roller bearings.

Iron Blast Furnace Reactions

Technical paper 391 of the above title has been issued by the Bureau of Mines, and may be purchased from the Superintendent of Documents, Government Printing Office, Washington, for 15c. It consists principally of a summary of information already presented during the last four years before various societies and published in the technical literature. Whether or not the operating blast furnace man will agree with the deductions reached by Messrs. Kinney, Royster and Joseph, the data which they secured on the gases existing in a 300-ton furnace and in the experimental furnaces at Minneapolis will furnish the necessary starting point for any consideration of the problem, "What goes on inside the blast furnace, and why?"

Offers Suggestions to Competitors in Arc Welding Contest

As a guide to competitors in the Lincoln arc welding prize for 1927, consisting of $17,500 given by the Lincoln Electric Co., Cleveland, and administered by the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York, the donors, state that practicable, workable ideas will get more consideration than ideas in which the practicability is open to question.

The problem is to develop or extend the field of usefulness of electric arc welding and make material and labor savings by its use. The object of each entrant should be to make concrete and practical application of the known facts and principles. The application should preferably be made in the field in which the entrant is at present engaged.

It is pointed out that to simplify the effort required to understand what has been done with electric arc welding up to the present time, the following classification may be profitably considered:

1. Welding in place of riveting on structural steel shapes and on hot-rolled plate.
2. Replacement of gray iron, malleable, and steel castings with welded steel equivalent, built up from hot-rolled steel plates and shapes.
3. Welding of non-ferrous metals.
4. Welding for maintenance and repair of existing machinery, equipment and structures made of metal.

Entrants in the contest may find applications of these principles in many products, such as steam boilers, pressure tanks, oil stills, air receivers, road building machinery, steel freight cars, tank cars, bridges and viaducts, steel smoke stacks, steel pipe, structural steel for buildings, automobile and truck frames, etc.

Considerations in Redesigning

The following rule-of-thumb methods, it is stated, will enable the entrant to make a start on redesign from gray iron castings to welded steel construction.

For parts where rigidity is the determining factor: Build the welded steel equivalent to the castings with the same outline dimensions but with only one-half the thickness of section.

For parts where strength is the determining factor and rigidity of secondary or no importance: Where strength alone is the determining factor, make the steel section one-fourth the thickness of the cast iron section. Where strength is the important factor, but rigidity a secondary consideration, make the steel sections one-third the thickness of the cast iron section.

The principles of application of electric arc welding described are applicable not only to steel, but also to the non-ferrous alloys. The rapidity with which new alloys are being developed and made useful to the industry makes this field of electric arc welding very important. Some work has been done. For instance, Stellite may be welded to common steel stock, thus producing the effect of a diamond-pointed tool.

It is now technically possible to weld aluminum, and it appears reasonable to assume that the application may be carried into the aluminum alloys, such as Lynite and Duralumin.

Welding in Maintenance and Repair Work

In welding for maintenance and repair of existing machinery, equipment and structures made of metal, the following fundamental laws should be kept in mind: The great localization of the heat of the welding arc permits welding to be done with a minimum of heat disturbance to the adjacent material. The electrical energy converted into heat by the welding arc appears in the metals being welded. The thermal efficiency of the arc, as a source of welding heat, is very high for this reason, and the heat cost of operation low.

The winners of the Lincoln Prize will be selected largely on the basis of amount of economic saving that the suggestion submitted shows either directly on the design submitted or in its possible wider application. The Lincoln Electric company will assist anyone by suggestions or data.

Mechanical Engineers to Hold Meeting at Seattle

A meeting at Seattle will be held by the American Society of Mechanical Engineers, Aug. 29, 30 and 31. Among the papers announced is one on special Diesel engine applications by H. D. Estep, engineer, and Gerald Frink, president, Washington Iron Works. The following committee chairmen have been appointed to take care of the various activities: Program, Ira Dye; finance, Lyle Dudley; entertainment, R. W. Rockwell and C. W. Tubby; excursions, John Moran and Philip Johnson; inspection trips, G. S. Schaller; and information and registraton, R. W. R. Rapport.

Iron and Steel Institute Fall Meeting in Glasgow

The annual autumn meeting of the Iron and Steel Institute will be held at Glasgow, Scotland, Sept. 20 to 23. Besides the usual program of technical papers, an interesting schedule has been arranged for visits to various steel and other plants. The afternoons of Sept. 20, 21 and 22 are to be devoted to such plant inspections, and they include all the principal steel works in the vicinity of Glasgow. The technical sessions will be held at the Royal Technical College, and the headquarters will be at the Central Hotel.

Foundrymen's Convention and Exposition in 1928

It has been decided that the annual convention in 1928 of the American Foundrymen's Association will be held in Philadelphia the week of May 14. At that time an exposition will be held in conjunction with the convention at the Commercial Museum in that city. The selection of a headquarters hotel has not yet been made.

Meeting on Management and Production at Rochester

The professional divisions of the American Society of Mechanical Engineers have a new policy of holding meetings in different parts of the country for their separate divisions. The first of these meetings, to be held by the management division, will be in Rochester, Oct. 24 and 25. This meeting is in cooperation with the American Management Association and with the local section of the society at Rochester, of which Ronald C. Hands, Eastman Kodak Co., is chairman. These meetings are to be national in scope and are expected to be of interest to more than the immediate locality. The speakers are being selected from a wide area. The program is as follows:

Monday morning session, "Coordinating Wage Incentives and Production Control."

Monday afternoon session, "Coordinating Quality Control and Production Control."

Evening Session, "Management's part in Maintaining Prosperity." This is the Management Week subject and this session will be in charge of the local Management Week committee consisting of Virgil M. Palmer, chairman, F. W. Lovejoy, James E. Gleason, Carl S. Hallauer, Frank W. Moffett, Donald S. Barrows, Walter L. Todd, and A. E. Crockett, secretary.

Tuesday morning session, "Economic Problems in Production.

Tuesday afternoon session, "Plant Location."

Average wages paid in the construction industry remained uniform for the five months ended in June, according to the Associated General Contractors of America. The level was at 227, based on 100 as the average for 1913. Only in May, 1926, with 228, was the present figure exceeded. Building materials in June were the same as in May at 182. This is considerably below their level of 1924 and early 1925 and is lower than the 183 of March and April, 1927.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Statistical Data Concerning the Chief Consuming Industries Indicate That:

1. Steel ingot production, dropping considerably in June, is still too high in relation to potential composite steel demand.

2. Demand in chief consuming industries should not fall so low this summer as in 1924.

3. Railroad traffic has declined and railroad income is materially lower.

4. Car orders in June were fairly large, but locomotive orders were only a fraction of those in May.

5. Structural steel sales are likely to fall considerably lower than in the second half of 1926.

6. Automobile production continues irregular and below last year, and a highly competitive condition is disclosed.

7. General manufacturing activity, outside of steel and automotive industries, was well maintained through May, but probably has declined since then.

8. Oil drilling and mining activity, which earlier were supporting the steel business, have been sharply curtailed.

9. Farm purchasing power continues unsatisfactory though better; farm machinery demand will not be likely to increase.

DULLNESS is probably the best word to use in characterizing the present condition of demand for iron and steel. Indications are that production will be curtailed further and that buying will continue cautious during the summer months. Already a few faint signs of a possible upturn in the fall have appeared, such as, for example, a little greater firmness in the scrap market and a few significant purchases of pig iron in quantity. But it is yet too early to arrive at any clear idea of the probable extent of an autumn recovery, which at present seems likely to be not much greater than seasonal.

The trend of our composite demand line continues decidedly downward. In other words, in May our estimate of the activity in the chief consuming industries continued the decline begun in April, falling to the lowest point since May a year ago. This means that the potential requirements of iron and steel consumers have decreased. It seems likely that the index will fall further and probably reach the lowest point since 1924.

Further Reduction in Ingot Output Likely

Production of steel ingots thus becomes clearly in excess of requirements, as is shown by the fact that the ingot curve in the first chart is well above the demand curve. In spite of the considerable decline in production which occurred in June, it is still too high, and further curtailment that will be greater than usual for the season must occur in July if the demand and supply are to be restored to equilibrium and steel prices show any strength.

It may be said, however, that at present there is no indication that the demand curve will fall as low as it did in 1924. Accordingly it seems unlikely that steel production will have to decline below a fairly normal level. The ill-advised expansion of the spring, however, will have to be paid for to some extent in the shape of a large summer curtailment, part of which has already occurred. The conditions accounting for the decline in the demand curve, with some indication as to probable future developments, may be outlined as follows:

Conditions in Specific Fields

Railroads: The tons of freight handled by the carriers declined considerably in April and May, and carloading data indicate that further recession occurred in June. This is due partly to the coal situation, though the loadings of ore, coke and merchandise have declined also, considering the season. This fact reflects a general recession in industry. The gross revenue of the railroads in May was only about the same

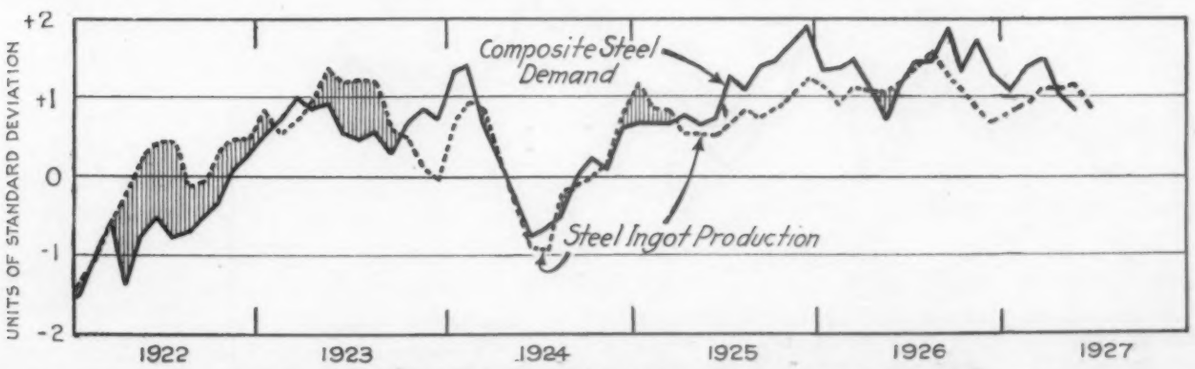


Fig. 1—Steel Ingot Production, Adjusted for Seasonal Variations, Appears to Be Excessive. Demand seems to be dropping decidedly

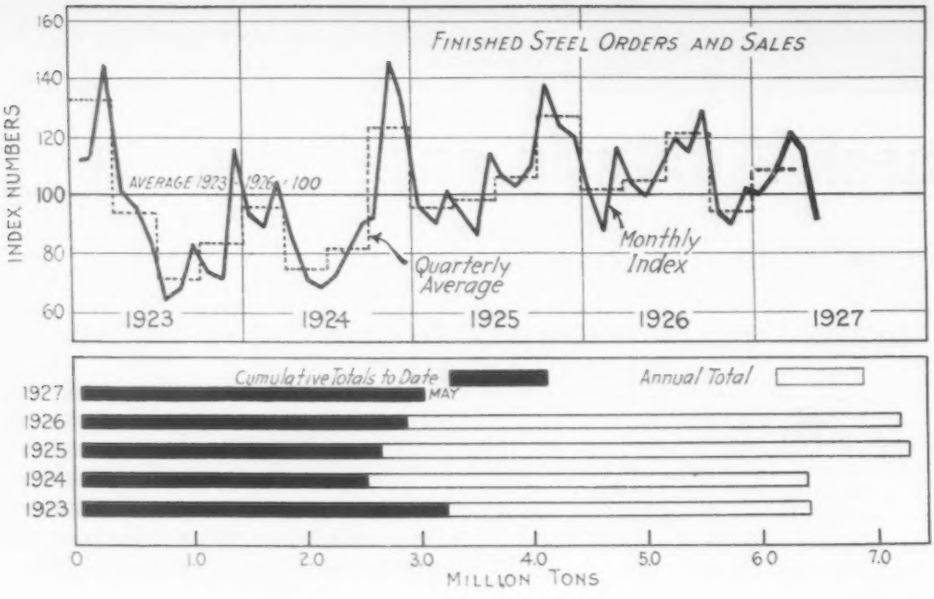


Fig. 2 — Finished Steel Orders and Sales Showed the Usual Heavy Seasonal Decline in May. This was especially true of sheets. Orders for structural steel dropped 15 per cent below April

as that of a year ago, and the net operating income was materially lower. No doubt the volume of railroad transportation will continue to be fairly large, but in general the railroads do not appear to be in a position to do a great deal of buying this summer.

Building: There was a decided slump in building activity in May, as indicated by the decline in floor space contracts. This trend is shown also in data such as the orders for sanitary enameled ware and architectural terra cotta. Building permits, too, continue to run below a year ago, being in June 13 per cent under June, 1926. June contracts showed a gain, and a fair volume of structural steel business in the shape of bridges and industrial construction continues, but little or no improvement is probable during the remaining summer months.

Automobiles: Automobile production appears to have fallen off a little, and is considerably under a year ago. Great uncertainty prevails in this industry, which is characterized by severe competition and reports of unsatisfactory sales. Dealer inventories of new cars are believed to be large in a good many cases. This situation explains the recent slowness in the buying of sheets. No improvement is likely before autumn.

Mining: Our index of mineral production has fallen sharply, due chiefly to the bituminous coal situation. The index of the petroleum industry, however, has declined also, for, while oil production has continued to increase, drilling activity has been sharply curtailed. The situation would seem to indicate a fair demand for plates, but a continued poor demand for pipe and other drilling materials.

Manufacturing: General manufacturing activity down through May continued to be one of the chief supports for the steel industry. Activity increased among the producers of cotton textiles, food products, chemicals and oils, tobacco and some building materials. It is believed, however, that the indexes of manufacturing production will show a decline in June and July. Certainly, the machine tool business has been poor and the small and halting volume of sales reflects the current uncertainty in business.

Agriculture: The agricultural situation is quite mixed, but on the average may fairly be called unsatisfactory. Agricultural prices are higher, both absolutely and with relation to non-agricultural prices. The quantity of the chief agricultural products marketed during recent months, however, has been small and the lateness of the season makes crop damage rather probable. While we think the agricultural outlook is better than at the beginning of the year, there appears little reason for expecting much gain in the volume of business from that quarter.

Exports: May exports of iron and steel amounted to nearly 202,000 tons, against 192,000 tons in April. This was considerably less than the usual seasonal gain, and accordingly our adjusted index declined. The main trend of iron and steel exports, allowing for the sea-

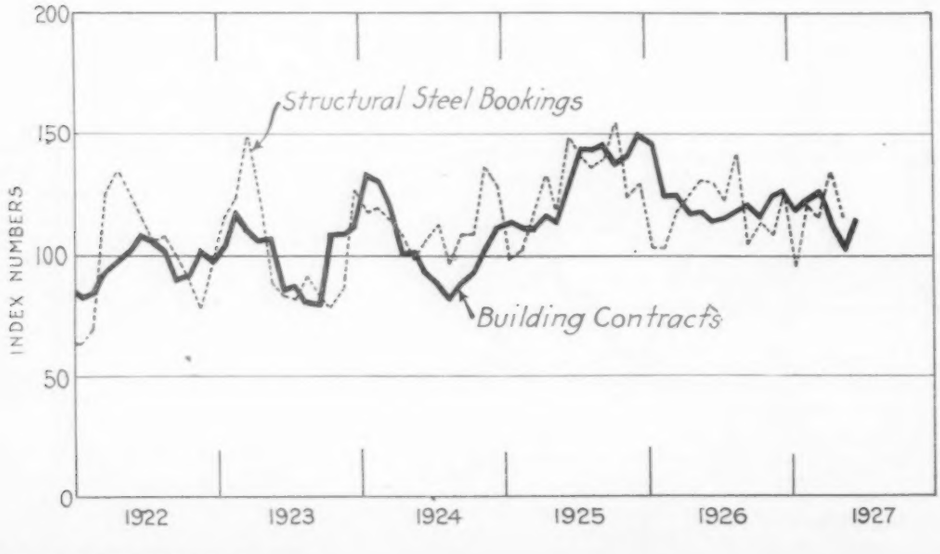


Fig. 3 — Building Construction May Have a Good Second Half, as in Recent Years, But Indications Are That It Has Passed Its Peak. Fabricated structural steel is likely to follow the same course

sonal factor, has been downward since November. We see little prospect for improvement in the volume or profitableness of such business.

Finished Steel Sales Drop Sharply

AS usual, the orders and sales covering the chief items of finished steel declined in May. Our estimates place them at 91.2 per cent of the monthly average for the years 1923-1926 inclusive, which compares with 115.8 per cent in April and 99.6 per cent a year ago. The decline in the sales of sheets was sharp. Structural steel lettings in May were only 206,700 tons, against 241,700 tons in April and 233,100 tons a year ago. Bookings of steel castings fell to the lowest point since September, 1925, and sales of fabricated steel plates were the smallest since last December.

The question is, will the order figures show an upturn in June, as was the case in that month in both of the last two years? This seems rather improbable. Current trade reports for June indicate a decrease, and the trend of the composite demand line appears to be downward. The total of the orders and sales in the second quarter will probably be considerably under the first quarter, as was the case in 1923 and 1924 (see Fig. 2). The total for the first five months is ahead of any year since 1923, but June and July sales are likely to lag so that the total for the year may well be behind both 1925 and 1926. All will depend upon the extent of the anticipated autumn upturn.

Large Building Construction May Not Last

BUILDING contracts (in floor space) amounted to 78,829,700 sq. ft. in June, against 74,079,000 sq. ft. in May, and this constitutes one of the most favorable indications. Our adjusted index, based on the average for the five years 1921-1925, was 115.6 against 102.5 in May and 114.1 a year ago. Permits and contemplated new construction, however, showed a downward trend. Bookings of structural steel in May were 115.3 per cent of the 1921-1925 average, in comparison with 134.8 per cent in the preceding month and 131.3 per cent in May, 1926.

Plainly, there is a close general relation between the two curves shown in the third chart, though it would be difficult to say whether one leads the other or not. It seems probable that building activity has definitely passed its peak, though it may recover in the second half of the year as it has done in most recent years. It is not likely, however, to reach as high a point as it attained last spring, and the total for the year will undoubtedly be considerably under 1926. It would seem to follow that the same statement would apply to structural steel bookings.

Car Orders, Fair; Locomotive, Poor

RAILROAD equipment records for June show locomotive orders to have been few, while freight car orders were fairly large. *Railway Age* reports only 38 locomotive orders, against 184 in May and 191 last year. Freight car orders, however, numbered 7566, in comparison with 4378 in the preceding month and 4270 in June, 1926. An increase in car buying in June is so frequent as to indicate that it is a seasonal occurrence, however, and, in view of the surplus of freight cars that exists and the declining trend in freight traffic, it seems doubtful if car orders will average up to normal during the summer months.

Certainly this is true of the locomotive business. Government figures show locomotive shipments to have numbered only 89 in June, which compares with 109 in May and 159 last year. Unfilled orders were only 393, against 427 last month and 667 a year ago.

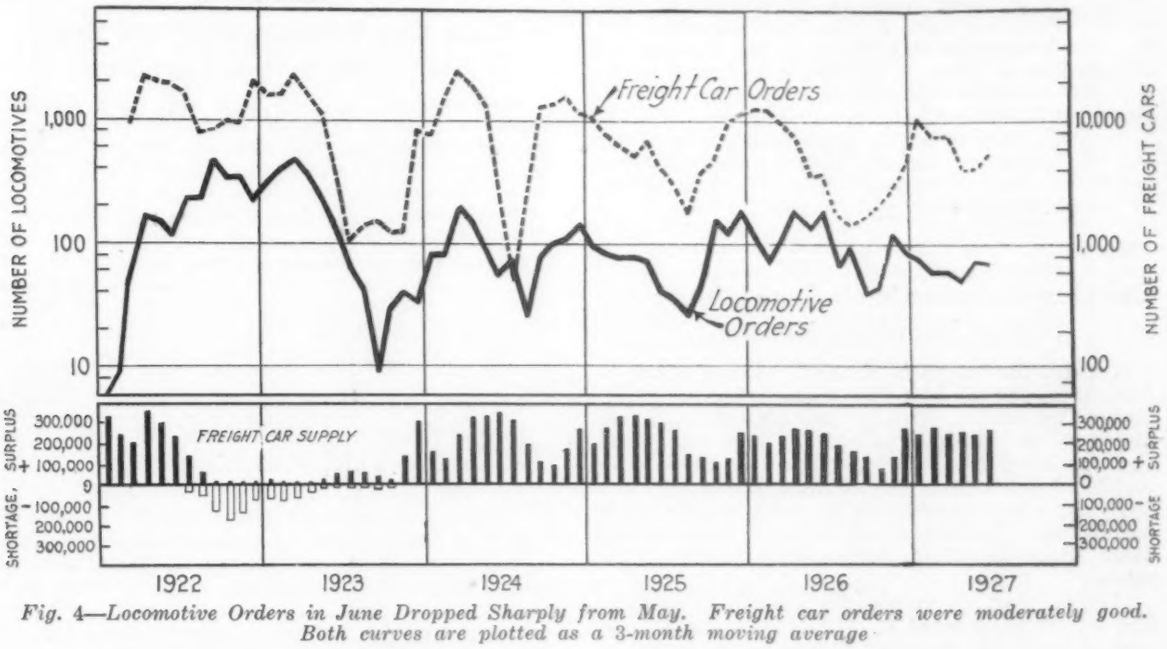


Fig. 4—Locomotive Orders in June Dropped Sharply from May. Freight car orders were moderately good. Both curves are plotted as a 3-month moving average

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Germany approximated its pre-war volume of agricultural machinery exports in 1926, according to advices received in the Department of Commerce from Trade Commissioner Theodore Pilger, Berlin, exportation being placed by official German statistics at 86,482 metric tons valued at 77,400,000 gold marks compared with 97,604 metric tons valued at 47,500,000 gold marks in 1913. Europe took 86 per cent of Germany's agricultural machinery exports in 1926. Russia was the chief outlet for German implements, amounting to 32,371 metric tons.

Schedule of the next installments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows: July 21—Position of Iron and Steel Producers; July 28—General Business Outlook; Aug. 11—Activity in Steel Consuming Industries.

Space Nearly All Taken for Steel Treaters' Exposition—Technical Sessions Planned

It is estimated that equipment worth more than $3,000,000 will be on exhibit during the week of Sept. 19 in the Convention Hall at Detroit, where the ninth annual National Steel and Machine Tool Exposition is to be held under the auspices of the American Society for Steel Treating. Besides the annual technical convention of the steel treaters, which is to meet the same week, the Institute of Metals will discuss nonferrous metallurgy, holding its meetings at the Hotel Statler. The usual production session of the Society of Automotive Engineers will be held the same week at the Book Cadillac Hotel, and at the same time the American Welding Society has scheduled a program of technical sessions at the same hotel.

It is estimated that the four combined conventions, together with the exposition, will draw more than 25,000 metal experts from all over the world. Practically all available space in the Convention Hall, which offers 93,000 sq. ft., has been contracted for, the actual figures being stated as 95 per cent for over 275 exhibitors. Close to $600,000 is estimated as the cost for exhibitors to transport and set up in operation their latest models in factory equipment.

A large number of the automobile plants of the city of Detroit have signified their intention of throwing their various departments open to the inspection of the visiting members and delegates.

Building Construction in June Highest for Any Month on Record

Construction contracts in the 37 eastern States in June amounted to $632,478,000, according to F. W. Dodge Corporation. This is the largest total ever placed in one month. The previous high record was that for last March, with $620,739,000. Three other months, August, 1925, August, 1926, and April, 1927, have been above $600,000,000, but below the figure for last March. The returns are from an area covering about 91 per cent of the country's total building volume.

For the first six months the amount of construction started has reached $3,187,993,000, which is 2 per cent ahead of the first half of last year. June contracts included nearly $239.000,000 for residence buildings, $151,000,000 for public works and utilities, $88,000,000 for commercial buildings, $42,000,000 for educational buildings, and $33,900,000 for industrial buildings.

In New York State and northern New Jersey the June total was the highest June figure ever recorded. The same is true in the Middle Atlantic States and the Central West. Other districts, however, showed a lag, including New England, the Pittsburgh district, the Northwest, Southeast, and Texas.

Sheet Mill Wage Rates Remain Unchanged

YOUNGSTOWN, July 12.—Tonnage rates for affected sheet and tin mill workers in mid-Western mills will continue at 25½ per cent above base for July and August, as a result of the bimonthly examination of sales sheets conducted Monday at Youngstown. The average selling price of Nos. 26, 27 and 28 gage black sheets shipped during the 60 days ended June 30 was revealed as $3 per 100 lb. This is unchanged from the average two months ago. Accordingly tonnage rates will be unaffected. It is indicated that some of the mills subscribing to the sliding scale wage agreement under which the settlements are conducted, are paying rates somewhat higher than those provided by the last settlement. Elias Jenkins, of Youngstown, acted for the manufacturers in the examination, and M. F. Tighe, of Pittsburgh, for the Amalgamated Association of Iron, Steel and Tin workers.

Bethlehem Reports on Employee Benefit Activities

Retired employees of the Bethlehem Steel Corporation last year received pensions amounting to $448,123, according to the corporation's annual report to employees published last week, which for the first time took on the nature of its yearly report to stockholders. During the year 143 men were retired on pension, increasing the number of pensioners to 999. Since the corporation assumed the management of the relief plan in June, 1926, the report shows, sick and disabled employees and their dependents have received $444,746, divided almost equally between death and disability benefits.

Under the Bethlehem stock ownership plan more than half the workers have applied for 245,000 shares of preferred stock with a par value of $24,500,000. During the last year the company has helped 504 employees to buy or build homes valued at $2,226,000.

Lake Ore Shipments in June Less, Season More than Last Year

Shipments of iron ore from the Lake Superior region in June at 8,458,925 gross tons were 311,626 tons or 3.55 per cent less than the 8,770,551 tons in June, 1926. The total shipments for the season to July 1 were 17,771,482 tons which is 2,877,683 tons or 19.32 per cent more than the shipments a year ago. Shipments by ports and for the season in 1927 and 1926 have been as follows in gross tons:

	June, 1927	June, 1926	To July 1 1927	To July 1 1926
Escanaba	928,530	1,038,377	1,862,358	1,801,231
Marquette	459,315	502,011	930,628	790,592
Ashland	1,113,151	1,148,385	2,309,186	1,899,832
Superior	2,325,965	2,363,930	4,822,434	3,928,655
Duluth	2,718,446	2,752,947	5,893,872	4,776,234
Two Harbors	913,518	964,901	1,953,004	1,696,594
Total	8,458,925	8,770,551	17,771,482	14,893,799
Decrease	311,626	.....	.....	.....
Increase	.....	.....	2,877,683	.....

Of the season's shipments this year, Great Northern's proportion was 24.44 per cent as compared with 23.16 per cent for the same six months in 1926. Duluth's percentage this year was 33.16 per cent as against 32.07 per cent last year.

Coal Supply for 54 Days

Industrial consumption of coal in May was a little less than in April, while production was greater. Nevertheless the reserve stocks declined 8 per cent and on June 1 represented 54 days' supply, against 56 days' on May 1, according to the National Association of Purchasing Agents. Details are shown in the table.

ESTIMATES OF UNITED STATES COAL PRODUCTION, CONSUMPTION AND STOCKS

(Net Tons)	United States Production (Total)	Industrial Consumption	On Hand In Industries, First of Month
January	63,128,000	44,671,000	55,010,000
February	58,576,000	43,536,000	57,450,000
March	64,075,000	43,237,000	65,735,000
April	43,109,000	38,600,000	77,455,000
May	44,475,000	37,817,000	72,288,000
June 1	.....	.....	66,510,000

If facilities for storage are available, an ample supply should be kept on hand and current needs supplied from the spot market. This, the consensus of opinion at the fuel meeting of the association, is predicated on present market prices and available supplies. It can be figured that it costs, on an average, 75c. a ton to put coal in and take it out of storage. Loss in heating value in storage over a period of months is negligible. There is, of course, a capital investment with an interest charge, but it may prove to be the cheapest form of insurance possible to buy.

Average weekly earnings in New York State factories in May are reported by the Industrial Commissioner at $29.18. This is one cent above the April figure, but otherwise, except for November, is the lowest since last August. It is, however, only 60c. lower than the figure for March, which was the highest ever recorded.

Asks for Bids on Steel for Panama Canal Zone

WASHINGTON, July 12.—The general purchasing officer, Panama Canal, has asked for bids on July 25 for 365 net tons of fabricated structural material and on July 27 for 650 net tons of grade No. 1 round steel reinforcing bars, 30 ft. in length. The bids are to provide for delivery at Cristobal or Balboa. The fabricated material will be for Mount Hope warehouse, 315 tons being for the main roof, 39 tons for the canopy over the platforms and 11 tons being for door frames. The deformed steel bars range in size from ¼-in. to 1-in.

Two Weeks Shut-Down of Ensley Works in August

BIRMINGHAM, July 11.—A shut-down for two weeks in the Ensley works of the Tennessee Coal, Iron & Railroad Co., planned for August, during which the greater portion of, if not the entire mills, will be out of commission, is announced in a statement issued by George Gordon Crawford, president of the company, as follows:

"The blooming mill engine at Ensley works has been in service 25 years and a new blooming mill engine has been held in reserve until the time the present engine was worn out.

"It is proposed, during a period of two weeks, sometime in the month of August to install the new blooming mill engine in place of the old engine, during which period the open-hearth department at Ensley works will necessarily have to discontinue operations. After installation of the new engine, the rail mill will start up and continue to roll rails now on our order books."

Gain in June Steel Corporation's Unfilled Orders

After five succesive monthly decreases the unfilled orders of the United States Steel Corporation increased in June. At 3,053,246 tons on June 30, the increase over its 3,050,941 tons on May 31 was not large, being 2305 tons. The last previous increase was in December when it was 153,522 tons.

The following table gives the unfilled tonnage by months, commencing with January, 1925:

	1927	1926	1925
Jan. 31	3,800,177	4,882,739	5,037,323
Feb. 28	3,597,119	4,616,822	5,284,771
March 31	3,553,140	4,379,935	4,863,564
April 30	3,456,132	3,867,976	4,446,568
May 31	3,050,941	3,649,250	4,049,800
June 30	3,053,246	3,478,642	3,710,458
July 31	.....	3,602,522	3,539,467
Aug. 31	.....	3,542,335	3,512,803
Sept. 30	.....	3,593,509	3,717,297
Oct. 31	.....	3,683,661	4,109,183
Nov. 30	.....	3,807,447	4,581,780
Dec. 31	.....	3,960,969	5,033,364

The high record in unfilled orders was 12,183,093 tons at the close of April, 1917. The lowest was 2,674,757 tons on Dec. 31, 1910.

Manufacturers of Electric Welders Combine

On July 1, the Taylor Welder Co., the Winfield Electric Machine Co., and the Winfield Mfg. Co., all of Warren, Ohio, were merged into the Taylor-Winfield Corporation, with assets of over $350,000. Officers of the company are, Albertis C. Taylor, president and general manager; G. P. Gillmer, vice-president; J. H. Ewalt, treasurer, and N. H. Cobb, secretary. Other directors are L. Jennings, Fred W. Platt, W. A. Wilson and W. A. Jones.

The concern dates back to 1903, when Albertis C. Taylor perfected an electric butt welding machine while in the employ of the Winfield Mfg. Co., a company originally founded for the manufacture of oil cans. Prior to the introduction of this machine, all such welders were leased on a royalty basis and the Taylor invention was the first butt welder to be sold outright.

The Taylor Welder Co. was incorporated in 1917, to exploit patents granted to A. C. Taylor on a new method of spot welding, which method, it is emphasized, was not an infringement of the so-called Harmatta patent. At this time the latter was in the process of litigation and eventually was decided to be invalid. The Taylor Welder Co., as well as other companies, were then free to use the Harmatta method.

The Taylor and Winfield concerns have thus been noted as pioneers in automatic welder construction, especially for flash welding lineal seams by the butt welding method, a process whereby sheets are joined together, producing a continuous piece without overlapping at the edges.

The company has received a large order from a Detroit manufacturer of automobiles for fully automatic machines to be used in the manufacture of a new type of steel piston. The piston is constructed of drop forgings and steel stampings and when welded has the same appearance and strength as if machined from solid steel.

Will Represent Philadelphia in Building Proposed Coke Plant

William Hutton Blauvelt, consulting engineer, 120 Broadway, New York, who specializes in the manufacture of by-product coke and the production of gas, has been appointed engineer and expert for the gas commission of Philadelphia. He represented the city in its negotiations with the United Gas Improvement Co. for a new lease of the Philadelphia Gas Works, which was consummated about 18 months ago.

In connection with Philadelphia's rapidly growing gas requirements, several plans have been suggested for the building of a by-product coke plant in or near the city and under the provisions of the new lease, bids for furnishing the city with coke oven gas from such a plant have been requested. Private interests have asserted that one or more blast furnaces should be added to this undertaking on account of the active iron market centering in Philadelphia.

Erie Steam Shovel and Bucyrus Companies Negotiating for Merger

Preliminary negotiations are under way between the Bucyrus Co., South Milwaukee, Wis., and the Erie Steam Shovel Co., Erie, Pa., which may lead to a consolidation of the companies. No formal action has yet been taken, but it is expected that both plants would continue to be operated as before, in the case of a merger, and plans for expansion inaugurated. The Erie company manufactures power shovels, locomotive cranes, railroad ditches, drag line excavators, etc., and the Bucyrus Co. makes railroad type and revolving shovels, dragline and trench excavators, dipper, hydraulic and placer dredges, spreader plows, wrecking cranes and other equipment.

Kalamazoo Malleable Iron Co. Expands

The Kalamazoo Malleable Iron Co., Kalamazoo, Mich., has completed additions to the north and south side of its plant. New air compressing, sand blasting and hydraulic pressing equipment has been installed. Since the appointment at the beginning of the year of C. J. Edwards as president and general manager of the company, T. R. Collins, for many years production and sales manager of the Buhl Malleable Co., Detroit, has been made assistant general manager of the Kalamazoo company, and James Linklater, recently works manager of the Michigan Malleable Iron Co., Detroit, has been made works manager. The Kalamazoo plant is engaged largely in the manufacture of castings for the automotive industry.

"The Magnolia Metal-Bearing Book" has recently been isued by the Magnolia Metal Co., 75 West Street, New York. Its 95 pages give complete information concerning the various products of the company and there are numerous illustrations.

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Essential Ferroalloys and Ores

DEPENDENCE of the United States in its steel-making activities upon outside sources of supply for certain key minerals is brought out graphically by the illustration on page 67. This shows in a markedly compact form our relations to 14 countries from which we get the greater portion of our vanadium, chromium, manganese, tungsten and nickel. With the single exception of nickel, of which Canada furnishes nine-tenths of our imports, every ton of all of the materials has to come overseas.

A repetition of the great war might find us hard put to it to obtain adequate supplies of these highly essential materials. In bringing out this point, which might conceivably lead to action in providing a national reserve of such ores, the intention is not so much to wave a danger flag as to counsel forehandedness.

This Issue in Brief

High-speed steel eventually may be made without tungsten, Army engineer believes. Investigation of the practicability of developing high-speed tool steel, using molybdenum as the principal alloy, is now being conducted—Page 69.

Discarded musket barrels made the first gas pipes. The tube-making industry was stimulated 112 years ago, when a Scotchman conceived the idea of screwing old musket barrels together in the form of continuous tubes, to conduct coal gas for lighting purposes.—Page 67.

New invention cuts losses caused by steel sheet "stickers" from 7 per cent to 2 per cent. A pair of rapidly oscillating jaw-shaped bars are introduced between the sheets. The sheets are drawn slowly over the bars, and 70 per cent are saved.—Page 70.

Can recuperators be used for open-hearth furnaces? Steel men are doubtful, pointing out that refractory materials necessary to withstand the high temperatures are not commercially available. Also, it is impossible to take away from the furnace more heat than the air entering the furnace is able to take up.—Page 71.

Heat treatment terms are agreed upon by three technical societies. The American Society for Testing Materials recommends the adoption of tentative definitions, which are expected to prevent confusion resulting from conflicting interpretation of the same terms.—Page 79.

Purely scientific research is far too costly for a private concern to undertake for private gain. In the long run it pays the country enormously, but the uncertainty of results, the high cost, and the years that pass by before returns come in, make it unattractive to capital, clamoring for immediate profits.—Page 80.

Oxygen content of pig and cast iron is related to silicon content, German metallurgists find. Tests reveal that oxygen content is higher in cast than in pig iron. Apparently blast furnace temperature has no effect on the oxygen.—Page 75.

Flue dust can be sintered for $1 per ton or less. The sintering of ores should not cost more than 75c. per ton. A 10 x 24-ft. pan should produce from 200 to 450 tons per day.—Page 72.

When welded steel is used in place of cast iron, the section should be reduced one-half, if rigidity is the determining factor. When strength is the determinant, the steel section should be one-fourth the thickness of the cast iron section, says welding equipment manufacturer.—Page 84.

Where high-thermal gas can be sold to householders and small industries, it is an economic waste to use it in the large furnace units of a steel plant, says steel plant engineer. The ideal condition would appear to be the sale of all the coal gas from high and low temperature distillation.—Page 78.

Improvement in steel quality was forced by Government's "educational orders." By specifying, for armor and ordnance, steel of greater physical properties than steel-makers thought it possible to attain, the Navy and War Departments hastened discoveries in alloying, heat-treating, and improved manufacturing.—Page 68.

Considerable motor car buying is being delayed until the new Ford models come out and their prices are known, is the feeling in Detroit. While production of motor cars as a whole has slowed up this month, the decrease does not appear to be greater than usual at this time of the year.—Page 112.

If more gas is needed in the steel plant, it should be produced from coal direct in the apparatus specifically designed for gas production, rather than by increasing the coke charged into the blast furnace. Even though returns from surplus gas are unusually high, and seem to offset the cost of higher coke consumption, it is a mistake to use the blast furnace for other than its main function of reducing and smelting iron ores, engineer holds.—Page 78.

Are we facing a period of competition for jobs? The increase in our industrial efficiency has enabled us to produce more goods with fewer men. Working hours have not been curtailed sufficiently to absorb the labor released. Will labor's competition for work reduce wages?—Page 92.

A manganese ore reserve could be built up gradually by the Government without disturbing the market. A reserve of 750,000 tons might cost 15 million dollars. Spread over five years, this would be 3 millions a year. The country would then be measurably secure, in the event of an emergency, against an interruption in the supply of this indispensable material.—Page 93.

Steel corporation's unfilled orders increase for first time in five months. The tonnage on order at June 30 was 3,053,246, a gain of 2305 tons over May 31.—Page 89.

The aggregate amount of money invested in dwelling construction is not equivalent to that much increase in our national saving. Some economists forget that buildings are destroyed by fire, flood, tornado, decay and demolition. These losses account for fully half the six billions of dollars a year we invest in new buildings.—Page 92.

ESTABLISHED 1855

THE IRON AGE

A. I. FINDLEY, *Editor* — W. W. MACON, *Managing Editor*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President* — George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. A. C. Pearson, *Chairman*. F. J. Frank, *Pres.* C. A. Musselman, *Vice-Pres.* Fred C. Stevens, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: 1362 Hanna Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Building. Buffalo: 835 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single Copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

PRINTED IN U. S. A.

Efficiency, and Then What?

A RECENT Department of Labor report showed a decrease of 11 per cent in the number of workers in the past four years at reporting establishments in the principal manufacturing industries. The report has attracted no little attention, and some superficial comment. It furnishes a small amount of testimony involved in a very large case. The question in a nutshell is: What shall the United States do, now that it has become so much more efficient?

We have been making the old things and rendering the old forms of service with less and less effort. Fewer man-hours are required year by year to do the same thing. We have been growing more "efficient" considering individuals or considering the particular lines of industry.

As a result, we have statistics showing increased activity, measured by quantities, while at the same time we have less employment. In the first half of this year 2 per cent more steel was made—and of course consumed—than in the first half of 1923; but the steel industry employed fewer men and engaged less of its plant facilities. The consumers of steel made the same showing, with perhaps some exceptions by certain industries carrying steel to a greater degree of finish. The exceptions are few, the outstanding one being that while in 1923 we built less than 25 passenger automobiles and trucks to one freight car built, in the past six months this proportion has been fully doubled, by freight car production decreasing.

If we make this a problem it becomes one of the most profound importance. If our attitude be *laissez faire*, we are certain to run into some difficulties, probably serious. What shall we as a country do with the spare time, energy and capital released by our increasing efficiency?

Whether the recourse should be to working shorter hours is a social problem, dealing with the question whether in the long run the individual really wants shorter hours, is satisfied to get along with the smaller comforts vouchsafed and can advantageously employ the spare time provided.

The economic aspect is different. It concerns itself with the question where the men can go who are released, for it is clear that men are released, that hours have not been shortened sufficiently in various industries to maintain the volume of payroll. In existing circumstances competition for jobs is a necessary outcome, and seeing that high wages have been largely responsible for our "prosperity" in the past few years such competition will not improve the situation as a whole.

An admirable way out would be for us to have more new things to do. The automobile and the radio have been very helpful in the past few years, and in the depression of the eighteen-nineties the bicycle served in the same way.

In this connection the much mentioned ample supply of capital needs to be considered. That is a matter of demand and supply. If the demand were greater the offerings of capital would not seem so large. Materials, appliances and labor are available for employing more capital than is being called for. A greater supply of ideas for putting the labor and capital at work would lead us out, would absorb what our increasing efficiency has been releasing.

Our Building Requirements

A LARGE part of our annual national savings materializes in the form of houses and other buildings required by the people. Our annual building is of the order of six or seven billion dollars, at recent and present prices, and often it is thoughtlessly reckoned by economists and statisticians that our national saving has increased by that much under this head.

The *American Builder* recently developed with an entirely different purpose some estimates which expose this fallacy and make the subject clear. We need not be too critical of the figures that are offered, which are manifestly approximations that are good enough.

The annual increase of about 1,600,000 in our population calls for about 400,000 new houses or apartments. The *American Builder* estimates the cost for this purpose at about 1.74 billion dollars, which looks reasonable. Other buildings required

for new population are estimated at 1.14 billion. We lose nearly half a billion a year by fire, flood and tornado, and about four billion through obsolescence, decay and demolition, which is estimated on the basis of a 33-year life.

The last factor of estimate is the one most to be criticized. Although it is true that careful researches have determined a figure of that order for municipal buildings, it is to be doubted whether it would obtain in respect to all of the dwellings of the country. Nevertheless it is to be well recognized that the physical property in which we put the surplus of our materials and labor is not permanent, but is constantly wasting away; and it is probably something like the truth that we have to invest about six billion dollars a year in new building in order to gain about three billion in wealth.

Accumulate Essential Minerals

MANGANESE, chromium, vanadium, tungsten and nickel are essential elements in American manufacture of steel—manganese for practically all our steel and the others for special steels, all of which are largely used in war. It happens that the bulk of our supplies of all of these materials comes from abroad.

With lively recollection of the mysterious loss of the United States Navy collier Cyclops in March, 1918, while bringing a cargo of manganese ore from Brazil, it behooves the United States Government to take action so that the country may be protected against the possible consequences of a like catastrophe in a future period of stress. Accumulation in this country, during times of peace, of adequate stocks of the ores of vanadium, chromium, manganese and tungsten would be merely insurance against possible disaster in time of war.

Purchases by the Government over a period of years need not disturb the market nor upset prices. A reserve of 750,000 tons of manganese ore might cost $15,000,000. Spread over five years, this would be $3,000,000 a year. The ore does not deteriorate and the expense of its care in storage would be negligible. Smaller quantities of the other minerals might be acquired on a similar basis.

Should it be argued that the United States is not in the business of providing raw materials for steel manufacturers, it suffices to say that that is not the intention of the present suggestion. The idea is simply to make the United States as a nation measurably secure against a sudden disruption of its lines of communication with its sources of vital supply. In any national emergency the ores could be delivered to domestic steel manufacturers on terms which the Government might see fit to make in the public interest. Above all, however, they would be in this country, where they could be used, instead of lying some thousands of miles away with no certainty of getting at them.

About 96 per cent of our manganese comes from Brazil, Russia, India and South Africa. Half of our tungsten comes from China, and half of the remainder from Germany; the other one-fourth from Burma and Bolivia. Nearly two-thirds of the chromium comes from South Africa, with smaller quantities from India, Greece and Cuba. Peru furnishes six-sevenths of the vanadium, the remainder coming from South Africa. Except for the small quantity of chromium and manganese coming from Cuba, all of these shipments involve ocean passages of 3000 to 10,000 miles over trade routes open to the raids of an enterprising enemy, even though relatively weak in total military force.

Steel vs. Concrete, with Complications

SHARP controversy has arisen of late between staff engineers and the consulting engineer of the North Jersey District Water Supply Commission. To steel fabricators it should be especially noteworthy as an instance of competition between different materials of construction. It warrants their study as a type of that competition between industries which is becoming more and more of a feature in their business, and yet has a greater complexity and number of unappraised factors than most situations they have to meet.

The problem to be solved is to deliver a large quantity of water from a new dam to the reservoirs of eight cooperating municipalities in the metropolitan district, the farthest one 21 miles away. The Water Commission staff had planned a single reinforced concrete aqueduct, about nine feet in diameter, with a riveted steel pipe in certain regions where pressure is high. The consulting engineer favors twin steel tubes of "smooth bore," (meaning thereby lock-bar, hammer, or fusion-welded pipe) for the entire distance.

"The issue ought to be plain," one might say. "Each would doubtless deliver the water safely; which is the cheaper?" But many considerations must be weighed before an answer can be given. It is said by one side that the twin steel tubes can be built in 16 months, whereas work on a concrete aqueduct will take at least two winters; the cost of engineering and interest during construction will increase with the additional time, to say nothing of the delay in delivering much needed water.

The advocates of concrete say that the additional carrying capacity of "smooth-bore" pipe over riveted pipe or concrete exists only when the pipe is new; that inside corrosion roughens the surface rapidly, especially by "tuberculation," and there is no known method of preventing this. Therefore a pipe designed for "smooth-bore" conditions will fail to deliver the expected volume. Likewise they point out that this corrosion will destroy the pipe in a relatively short time, when compared with the permanency of water-proof concrete. The claimed life of 100 years for steel pipe they cannot accept, and the amortized cost (which is the true cost) will be least for the conduit having the longest life, since the first costs of the two projects are not widely different.

The consulting engineer says the twin steel tubes give greater safety than a single conduit; that one accident would not be likely to break both; furthermore, that repairs and cleaning can be done during periods of low water consumption when one of the twin tubes could almost keep pace with the demand. He also believes that the quality of concrete depends to an undue extent upon the skill and honesty of the workmen, whereas steel construction involves less of this personal equation. His opponents point out that welded construction is not without suspicion on the latter count, and that the whole matter is one of proper design and supervision.

The question of cost is particularly difficult to

solve. The engineering and overhead costs have been noted above. One consideration that is probably no less valid because it arises so rarely is the claim that, since the large single tube will project above the surface of the ground when passing through certain high-class residential sections, it consequently will cost excessive property damages and condemnation proceedings in these communities. The estimated cost of either project will also vary by a hundred thousand dollars, if such items as rock excavation be taken at $5 or $6; top soil at $1 or $1.50; reinforced concrete at $20 or $25, and reinforcing steel at 6c. or 7c. Finally, no one knows how long either aqueduct would last.

Obviously, when industries and materials are competing for a big contract, the issue is far from plain. In this instance, the problem of steel vs. concrete may be decided by such apparently remote factors as land damages, the cost of rock excavation, whether it is safe "to put all your eggs in one basket," and not the least, exhaustion of the patience of the cooperating municipalities.

Bonds and the Dollar Value

THE existence of tens of billions of dollars of investments in bonds and mortgages was expected, in the inflation period before and for a year and a half after the Armistice, to act as a brake upon the movement of commodity prices. No doubt there was such a tendency, but there was no means of measuring it. Now we are in a different situation. For seven years the general commodity trend has been downward, and a very complicated case is presented, for bonds seven to ten years old have an increased commodity purchasing power, while much older bonds have a low purchasing power.

There was a time, 31 years ago, when this subject was in the forefront and more thought was given to it than at present. Mr. Bryan was preaching "the rich growing richer and the poor growing poorer," with much reference to "bloated bondholders." Merely in six years commodity values had fallen 17 per cent, whereby the purchasing power of income from bonds and mortgages had increased 21 per cent. The present Bureau of Labor index series, based on 1913 as 100, averages 1890 at 81 and 1896 at 67. With this recollection we cannot blink the importance of the subject.

In these recent years we have had some new alinements. A bond or mortgage income purchased in 1896 had, in May, 1920, when the commodity index reached its peak of 247, a purchasing power of only 27 cents on the dollar of 1896. Conversely, an income purchased in May, 1920, would have had a purchasing power in the past twelvemonth ranging between $1.65 and $1.75 in dollars of value existing at the time of purchase.

The position of those who have issued bonds is different. Some who issued bonds in 1920 and 1921 are disadvantaged even more than is indicated by the fall in commodity prices, in that they had to offer particularly high interest rates in order to secure purchasers. Not a few bonds were issued to yield up to 8 per cent. Even on the commodity basis of January, 1921, which was 170, such bonds have now about one-fifth higher yield. Thus there are bonds and bonds. Those purchased prior to late in 1916 have a lower income expressed in commodities, and bonds purchased since then, with the exception of one brief spell in 1921-2, have a higher income than would be obtainable on a purchase made at the present time.

The foregoing comment is based upon the common inference that the commodity level represents the value of the dollar, but that is not wholly the case. Improvements in practice and increase in competition tend to lower selling prices of many commodities relative to dollars of the same value. Both the issuer and the holder of bonds may benefit by the former, but price lowering by competition is disadvantageous to the issuer while advantageous to the holder. It is chiefly because the course of trade seems so steady that so little attention is paid to the influence of bonds and mortgages as a factor in shaping the general trend of things. Some time the subject may come to the front.

STATISTICS do not support the statements made in recent convention discussions to the effect that Bessemer steel castings have had their day and are being replaced by electric and open-hearth castings. The figures of the American Iron and Steel Institute show that in 1923 and 1924 about 4.7 per cent of the total production of steel castings was made in converters—(67,512 tons and 53,437 tons respectively). In 1926, with an output of 56,947 tons, the Bessemer percentage fell only ½ per cent to 4.2 per cent. It appears that, while the output of electric steel castings has had a notable increase (from 206,549 tons in 1924 to 326,445 tons in 1926), this has not been at the expense of the Bessemer products. Relative to the open-hearth the position of the electric furnace has improved, for in 1924 open-hearth castings, at 859,419 tons, were 76.67 per cent of the total production, whereas in 1926, at 972,125 tons, they were but 71.61 per cent.

CORRESPONDENCE

Organized Labor's Attitude Toward "Greater Productivity"

To the Editor: An editorial in THE IRON AGE of June 23, page 1833, under the title "More Productivity and Overproduction," reads as follows:

> "Even organized labor professes to favor further mechanizing of tasks and other methods of increasing efficiency 'in order that selling prices may be lower and wages higher.'"

And some lines below:

> "Greater productivity fails to achieve its end without a corresponding expansion of markets."

Permit us to remark that organized labor does not identify increasing productivity with increasing total production. Organized labor does not think that "greater productivity fails to achieve its end without a corresponding expansion of markets" if, for instance, due to increasing productivity and unchanged production, the number of hours work could decrease. Expansion of markets is thus only one of many ends.

The editor of THE IRON AGE will understand that

with this point of view organized labor deems as unjustifiable the deductions following from the statement "Greater productivity," etc.

WILLIAM GREEN,
President American Federation of Labor.
Washington, D. C., July 1.

Cyanide Concentration and Blast Furnace Theory

To the Editor: In regard to the note under "Theory of the Blast Furnace," page 1769, of THE IRON AGE, for June 16, the Bureau of Mines surveyed three planes of a Southern furnace with water-cooled sample tubes, finding cyanides in the order of 3 to 4 oz. (0.18 to 0.25 lb.) per 1000 cu. ft. These results were confirmed by semi-large scale tests where five tests were conducted over a period of 23½ hr., during which time some 277,000 cu. ft. of gas were passed through a condenser attached close to the furnace at a point 19¼ ft. above the tuyeres. The results gave a cyanide concentration on the five tests which varied from 2.99 to 4.22 oz. per 1000 cu. ft. or an average of 3.47 oz. (0.22 lb.) per 1000 cu. ft. for some 277,000 cu. ft. of gas. The results of this investigation are reported in full in United States Bureau of Mines technical paper No. 390, "Occurrence, Distribution, and Significance of Alkali Cyanides in the Iron Blast Furnace," by S. P. Kinney and E. W. Guernsey.

S. P. KINNEY,
Metallurgist United States Bureau of Mines.
Minneapolis, Minn., June 21.

Sharp Fall in June Steel Ingot Output

Daily Rate 133,314 Tons, or 13.7 Per Cent Under May—Half Year About 1.5 Per Cent Less Than Last Year

A DECIDED decline in the production of steel ingots took place in June, according to statistics issued by the American Iron and Steel Institute. A new basis of computation has, however, been inaugurated, the institute not now including in its data the figures for crucible and electric steel ingot output, "as it has not been found feasible to secure monthly figures from a sufficient proportion of producers to fairly represent the production of steel ingots by these processes."

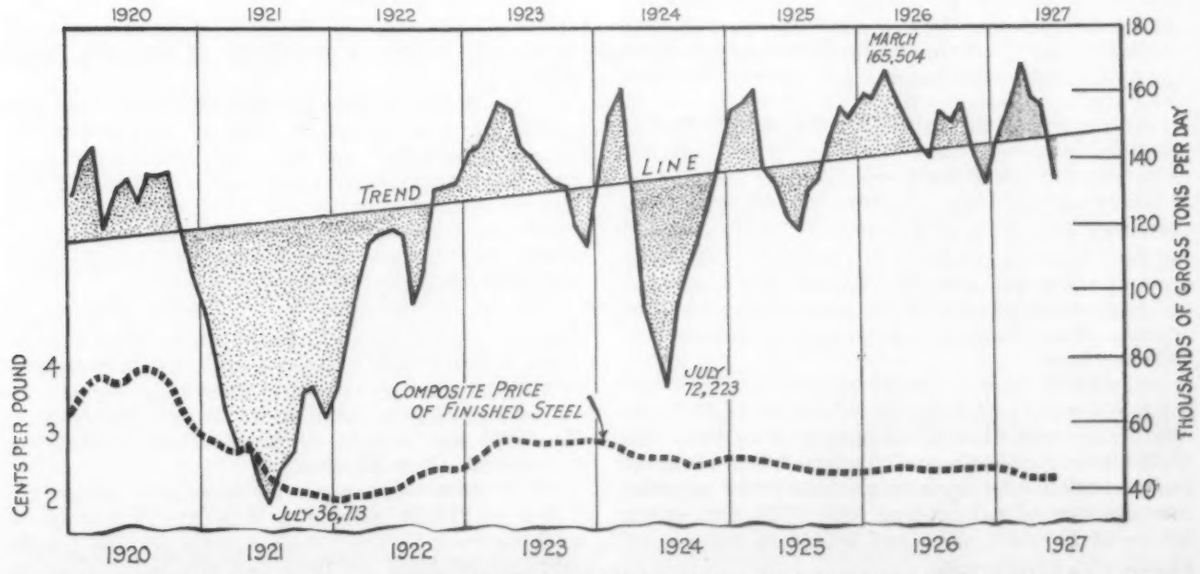
The approximate June daily production is put at 133,314 gross tons in open-hearth and Bessemer steel as compared with 154,430 tons for May. (May was estimated at 155,624 tons per day on the old basis, including electric and crucible steel.) There is a decline in June from May of 21,116 tons per day or 13.7 per cent. The calculated percentage of operation for June was 82.10 per cent as against 95.10 per cent in May, counting capacity of open-hearth and Bessemer plants at 50,500,000 tons per annum.

For the half year, the calculated production for all companies, crucible and electric output being omitted, was 23,616,554 tons. If there is added, the estimated production of these two classes of steel, based on the 325,200 tons made last year, then the calculated output for the first half of 1927 will approximate 23,776,000 tons. This is about 377,000 tons or 1.56 per cent less than the 24,153,800 tons made to July 1, 1926.

The companies reporting made 95.40 per cent of the open-hearth and Bessemer steel ingots last year, and the total was calculated on the basis that the non-reporting companies maintained their relative proportion of the output this year. The table gives the production of steel ingots by the two processes as reported and the calculated monthly and daily production of open-hearth and Bessemer steel for 1927 and of all the processes for 1926.

Production of Steel Ingots
(Gross Tons)

Months	Reported by Companies Which Made 95.40 Per Cent of the Steel Ingots in 1926		Calculated Monthly Production All Companies	Approximate Daily Production All Companies
1927	Open-Hearth	Bessemer		
Jan.	3,041,233	545,690	3,759,877*	144,611*
Feb.	3,042,232	565,201	3,781,376*	157,557*
March ..	3,701,418	590,716	4,499,092*	166,633*
April ...	3,340,852	565,634	4,094,849*	157,494*
May	3,272,810	557,683	4,015,192*	154,430*
June ...	2,820,677	486,047	3,466,168	133,314
6 Mos. ..	19,219,222	3,310,971	23,616,554	152,365
*Revised.				
1926				
Jan.	3,326,846	581,683	4,132,210	158,931
Feb.	3,023,829	556,031	3,785,051	157,710
March ..	3,590,791	635,680	4,468,617	165,504
April ...	3,282,435	601,037	4,105,799	157,915
May	3,201,230	516,676	3,927,979	151,076
June ...	3,036,162	498,764	3,734,153	143,621
6 Mos. ..	19,461,293	3,389,871	24,153,809	155,831
July	2,911,375	526,500	3,634,993	139,807
Aug. ...	3,145,055	627,273	3,986,966	153,345
Sept. ...	3,089,240	612,588	3,913,383	150,515
Oct.	3,224,584	630,526	4,074,544	156,713
Nov.	2,915,558	592,239	3,705,744	142,529
Dec.	2,788,479	493,172	3,466,766	133,337
Total ...	37,535,584	6,872,169	46,936,205	150,920



Production of Steel Ingots in June was Decidedly Less Than in May. It Is Considerably Below the Line Representing the Trend of Consumption

Iron and Steel Markets

Forward Steel Buying Declines

With the Pronounced State of Short-Range Buying, Steel Prices Retain General Stability—July Likely Low Month—Southern Pig Iron Reduced

ONE fact developed by this week's surveys of the steel trade is a marked reduction in the volume of contract buying. In the face of consumer striving for zero inventories and, now, an accenting on minimum purchase obligations, there is nevertheless continued resistance to price concessions, and buyers are finding an increasing confidence on the part of producers that a certain flow of orders must ensue and price is a secondary matter.

Cheerful views are general as to a sustained demand at fully the present level for some weeks, and signs are observed already of the usual overadjustment of supply to demand by a swing downward of production below the going rate of sales. The industry is operating at the moment at about 65 per cent of capacity, or 10 points below the 74½ per cent which it averaged in June.

Some measure of the rapid shaping of production to needs is gained by the sharp reduction in the June output of steel ingots and by the slight increase, 2305 tons, in the Steel Corporation's unfilled orders for the month. With an indicated total of 134,000 tons per day, last month showed a drop of 13.7 per cent from the May rate of ingot output. A year ago the recession was not 5 per cent. The Steel Corporation's situation as to orders suggests a close adjustment of shipments to the present scale of close-range buying.

Comparisons point to a parallelism of 1927 with 1925. Then July was the low month in operations, which were some 26 per cent off from the high point of March, that year. June showed a falling off of 23½ per cent from the high, and this year June is 20 per cent under last March. A point to be emphasized is that the production of steel ingots for the six months of this year is only 1½ per cent under the record made in the first half of 1926. The half year of 1925 was 7½ per cent smaller than this record.

Railroads and the building industry contributed prominently to the week's buying. The Pennsylvania and the Great Northern closed on 80,000 tons of heavy section rails, of which 15,000 tons, however, may go into 1928 deliveries. In the railroad car field, if early purchases are made, it is expected some of these will also be for next year's account and contracted for only on the score of securing low prices. The Chesapeake & Ohio is inquiring for 30 locomotives.

Structural steel bookings reached a high total for midsummer—51,500 tons, of which 16,000 tons was for the new Chanin Building in New York and 10,000 tons for a General Motors truck plant at Pontiac, Mich. Among new projects under negotiation are two of outstanding size, 7500 tons for a bridge at Portland, Ore., and 5000 tons for a hotel addition in Pittsburgh.

Concrete reinforcing steel awards amounted to 11,000 tons, of which 2150 tons was for municipal waterworks construction in St. Louis; 1500 tons for a canal project in Washington State and 1500 tons for a warehouse in Cleveland. New projects totaling 8000 tons include 2000 tons for sewerage work at Stickney, Ill.

Alabama pig iron has declined 75c. a ton in response to pressure by large Southern consumers and a desire to meet competition in border line territory along the Ohio River. New York State furnaces are more aggressive in soliciting business in New England and eastern Pennsylvania, in some cases waiving silicon differentials.

The coal strike is approaching a crisis in southern Ohio. The operators, following the rejection of an offer to recognize the union and to pay wages comparable with the November, 1917, scale, are planning to reopen their mines without a union agreement, July 16. In the Pittsburgh district the Jones & Laughlin Steel Corporation has successfully opened a mine on an open shop basis without bringing in outside help. Coke prices are unchanged, and coal supplies are more than ample to meet present demands.

Divergent tendencies are to be observed in the scrap market. At Philadelphia heavy melting steel has dropped 50c. a ton, and various grades have been reduced at Boston and Buffalo. On the other hand, advances of 25c. a ton have been made in heavy melting steel at Pittsburgh, Detroit and St. Louis.

Agricultural machinery manufacturers find encouragement in the crop outlook and are preparing for a late summer and fall trade.

The cotton tie prices for the opening of the season were announced July 11. They are substantially the same as last year, $1.20 a bundle of 45 lb. at Gulf ports and $1.21 at Atlantic Coast points.

The decline in cold finished steel bars was not ended by announcing a base of 2.30c. per lb. for third quarter business, as 2.20c. has lately become common and is no longer confined to the Detroit district.

Competition in nickel-chrome and other alloy steels used in considerable tonnages has brought out some deviations from ruling quotations.

Ocean freight rates on steel from Atlantic to Pacific Coast points will be advanced $3 a ton on Aug. 1, but whether Eastern mills will absorb any of the extra charge is not yet known.

After selling as high as 72.50c. per lb. on Nov. 23, 1926, spot Straits tin has touched 63.25c., the lowest since July 22, 1926.

THE IRON AGE pig iron composite price has fallen to $18.59, compared with $18.71 last week and the week before. Both figures are the lowest since early April of 1922 and the latest level is only 57c. above the lowest reached since 1916.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	July 12, 1927	July 5, 1927	June 14, 1927	July 13, 1926
No. 2, fdy., Philadelphia	$21.26	$21.26	$21.76	$21.76
No. 2, Valley furnace	18.00	18.00	18.00	17.75
No. 2, Southern, Cin'ti	*20.94*	21.69	21.69	24.19
No. 2, Birmingham	*17.25*	18.00	18.00	21.00
No. 2 foundry, Chicago*	20.00	20.00	20.00	21.00
Basic, del'd eastern Pa.	20.75	20.75	20.75	21.00
Basic, Valley furnace	17.50	17.50	18.00	17.50
Valley Bessemer, del. P'gh	20.26	20.26	20.76	20.26
Malleable, Chicago*	20.00	20.00	20.00	21.00
Malleable, Valley	18.00	18.00	18.00	17.75
Gray forge, Pittsburgh	19.26	19.26	19.26	19.01
L. S. charcoal, Chicago	27.04	27.04	27.04	29.04
Ferromanganese, furnace	90.00	90.00	90.00	88.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	34.00
Bess. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. billets, Pittsburgh	33.00	33.00	33.00	35.00
O.-h. sheet bars, P'gh	33.50	33.50	33.50	36.00
Forging billets, P'gh	39.00	39.00	39.00	40.00
O.-h. billets, Phila.	38.30	38.30	39.30	40.30
Wire rods, Pittsburgh	42.00	42.00	42.00	45.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.22
Iron bars, Chicago	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh	1.80	1.80	1.80	2.00
Steel bars, Chicago	2.00	2.00	2.00	2.10
Steel bars, New York	2.14	2.14	2.14	2.34
Tank plates, Pittsburgh	1.80	1.80	1.80	1.90
Tank plates, Chicago	2.00	2.00	2.00	2.10
Tank plates, New York	2.09	2.09	2.09	2.24
Beams, Pittsburgh	1.80	1.80	1.80	2.00
Beams, Chicago	2.00	2.00	2.00	2.10
Beams, New York	2.04	2.04	2.09	2.34
Steel hoops, Pittsburgh	2.30	2.30	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	July 12, 1927	July 5, 1927	June 14, 1927	July 13, 1926
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	3.00	3.00	3.00	2.95
Sheets, black, No. 24, Chicago dist. mill	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, P'gh	3.85	3.85	3.85	3.80
Sheets, galv., No. 24, Chicago dist. mill	3.95	3.95	3.95	3.95
Sheets, blue, 9 & 10, P'gh	2.25	2.25	2.25	2.30
Sheets, blue, 9 & 10, Chicago dist. mill	2.35	2.35	2.35	2.40
Wire nails, Pittsburgh	2.50	2.50	2.50	2.65
Wire nails, Chicago dist. mill	2.55	2.55	2.55	2.70
Plain wire, Pittsburgh	2.40	2.40	2.40	2.50
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh	3.20	3.20	3.20	3.35
Barbed wire, galv., Chicago dist. mill	3.25	3.25	3.25	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Materials, Per Gross Ton:				
Heavy melting steel, P'gh	**$15.00**	$14.75	$14.75	$17.00
Heavy melting steel, Phila.	*13.50*	14.00	14.00	15.00
Heavy melting steel, Ch'go	12.00	12.00	12.00	14.25
Carwheels, Chicago	13.50	13.50	13.50	16.50
Carwheels, Philadelphia	15.00	15.00	15.50	17.00
No. 1 cast, Pittsburgh	15.00	15.00	15.00	15.50
No. 1 cast, Philadelphia	16.00	16.00	16.00	17.00
No. 1 cast, Ch'go (net ton)	14.50	14.50	14.50	17.25
No. 1 RR. wrot, Phila.	16.00	16.00	16.00	16.50
No. 1 RR. wrot, Ch'go (net)	**11.25**	11.00	11.00	13.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$3.00	$2.90	$2.75
Foundry coke, prompt	4.00	4.00	4.00	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	12.62½	12.62½	12.75	14.12½
Electrolytic copper, refinery	**12.37½**	12.25	12.37½	13.87½
Zinc, St. Louis	**6.17½**	6.15	6.30	7.52½
Zinc, New York	**6.52½**	6.50	6.65	7.87½
Lead, St. Louis	*5.95*	6.02½	6.15	8.20
Lead, New York	*6.20*	6.30	6.45	8.40
Tin (Straits), New York	*63.50*	64.50	67.75	62.62½
Antimony (Asiatic), N. Y.	*11.75*	12.00	12.50	14.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Gain in Corporation's Unfilled Orders Not Typical of Industry as Whole

PITTSBURGH, July 12.—The increase in the unfilled orders of the Steel Corporation in June surprised many and has furnished a topic of discussion in the local trade, but the more common conclusion is that as its shipments and production declined last month, the effect of the bookings by its structural and rail-making subsidiaries was greater than would have been the case if general shipments had been up to the May rate. The opinion is also expressed that some third quarter contracting, notably in bars, figures in the June statement. The gain does not reflect the situation in the industry as a whole, as the independent manufacturers, generally, ended June with less business on their books than at the end of May and there has been a gradual sagging of steel works and rolling mill activity in keeping with that fact.

Ingot production of the corporation in this district is at about 75 per cent of capacity, but the average of the independents is nearer 60 per cent, with some not even doing that well. The Jones & Laughlin Steel Corporation has put back one of its Eliza furnaces, banked late last month, now having eight of 12 in production, but the Bethlehem Steel Co. has taken off one of its Cambria furnaces and now has only five out of 10 at that works in blast.

With the resumption of the furnace of the Shenango Furnace Co., Sharpsville, Pa., which was banked for several days around the holiday, there are now 67 out of 125 furnaces in this and nearby districts in production, with six of the 18 merchant furnaces active.

In spite of current dullness, steel prices are holding well. The recent reduction in cold-finished steel bars does not seem to have ended the weakness in that product, but the market is steady on the heavy tonnage lines and can be described as firm on sheets and strips.

Consuming industries reflect no tendency toward adding to inventories; indeed, the trend is in the other direction and steel makers still are without definite clues as to what the remainder of the year will produce. The automotive industry still awaits action by the Ford Motor Co. with respect to its new model, since a car of the specifications recently published would not only cut into sales of cars of its class, but of those priced a little higher. It is probably a good guess that if the Ford car takes more steel, it will be at the expense of others and that the steel requirements of the automobile industry as a whole will not increase.

A short-covering movement by scrap dealers, unable to draw upon the Detroit district so heavily as prior to the movement of old material by water from Detroit to Buffalo, has had a strengthening effect upon local scrap prices. But dealers are finding it hard to make sales here at much of an advance over recent prices.

Pig Iron.—Several consumers of forge iron are figuring on an order requiring about 2000 tons of that grade. Except for this inquiry, the market is almost lifeless, with only occasional sales, and these usually of a carload. There is no interest in basic iron, as most consumers are covered by requirement contracts and those who come into the market are supplied for the present through purchases made several weeks ago. Valley furnaces are still quoting this grade at $17.50, but it is

purely a nominal figure. Small lots of Bessemer iron are moving at $18.50, and of foundry iron, at $18 for No. 2.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.50
Bessemer	18.50
Gray forge	17.50
No. 2 foundry	18.00
No. 3 foundry	17.50
Malleable	18.00
Low phosphorus, copper free	$27.50 to 28.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—Users of high grade ferrosilicon are specifying against contracts very steadily, but in ferromanganese and spiegeleisen the tendency of consumers is to order out the minimum rather than the maximum quotas. Spot offerings of the latter are now fairly large. Prices are unchanged.

Semi-Finished Steel.—There is very little open market activity in any form of semi-finished steel and the movement on contracts is only moderately heavy, since the sheet, tin plate, strip and pipe manufacturers who buy their crude steel are operating at a rate that does not call for full supplies. Makers are having no difficulty in supplying all demands upon them promptly. In such situations maintenance of prices is about all that is possible, and although Youngstown mills appear to have succeeded in establishing sheet bars at $34, Youngstown, $33.50, Pittsburgh, has not yet disappeared. There seems to have been more or less covering of rod buyers before the recent restoration of $43, base Pittsburgh or Cleveland, as the ruling market price, and although little of the tonnage leaving the mills carries the latter price, there is no evidence that the mills are taking new business at less.

Bars, Plates and Shapes.—These products continue to be quoted at 1.80c. to 1.85c., base Pittsburgh, and on bars and plates these prices are well maintained in the Pittsburgh district. It is still hard for the mills to get more than 1.80c., base, even for comparatively small tonnages of large shapes. While competition for fabricated steel work seems to be a little less intense than recently, this has been reflected mainly in a narrowing of the spread between bids, and with structural jobs going at around $63 to $65 a ton, delivered, the mills are forced to make plain material prices fit in with those prices. There is a fairly good run of structural steel business, notably in this district, where pending work includes at least 5000 tons for an addition to the William Penn Hotel, Pittsburgh, while about 400 tons will soon be placed for the Monongahela Bank Building. Important users of steel bars are running rather light, and orders and specifications in plates are moderate. Iron bars are dull and easy.

Wire Products.—All makers are holding to the recently restored prices on nails, staples and barbed wire, and on such new business as has developed, no deviations from these prices are noted. No real test of them has yet been possible, however, as buyers were given coverage prior to the advance and still are able to draw against lower-priced orders. Last month's bookings were swelled by the change in prices, and this month's specifications are reported to be good for the time of year and in comparison with steel business in general.

Rails and Track Supplies.—The Norfolk & Western Railway is now expected to enter the market for 60,000 tons of standard-section rails on July 20. This road usually is largely supplied from Pittsburgh. The gain in the Steel Corporation's unfilled tonnage for June is credited in some quarters to rail orders, some of which were placed in time to be figured in the report. Generally, business in rails and track supplies is quiet in this district, and prices are steady largely because they have not been tested by large inquiries.

Tubular Goods.—Some quickening is reported in the demand for standard-weight pipe, but in spite of that fact and a steady demand for small lots of line pipe, the market is active only by comparing it with the average situation for a period of several years and making allowance for the fact that since 1923 productive capacity has increased about 30 per cent. The natural gas industry has been the backbone of the demand for line pipe, as few oil pipe lines have been laid and the heavy production of the Seminole, Okla., field has brought about such low prices for oil that drilling elsewhere has been materally curtailed, with a consequent decrease in the demand for casing and drill and drive pipe. There is a fair movement of boiler tubes, but it is still below the ability of makers to supply them.

Sheets.—The firmness of prices continues to be the feature of the market situation. In the face of a demand that can be easily supplied from an operation of 75 per cent of the country's productive capacity, there is practically no deviation from quoted prices. Incoming business is running heavily to small tonnages for reasonably prompt shipment and the mills are not accumulating much tonnage, but the outlook for business is brightened by the fact that consumers are not building up stocks. Indeed, the motor car builders seem to be liquidating what they have.

Tin Plate.—Mill operations are running from 70 to 75 per cent of capactiy, or slightly less than the June average. Contract buyers are taking shipments very steadily, but there is little new business and few emergency orders, such as often develop at this time of the year because of underestimates of the requirements for packing fruits and vegetables. Tin plate prices are holding well, despite some weakening in tin mill black plate. Shading, which has been going on for several weeks in short ternes, has found reflection in a formal reduction of 30c. to 80c. per case.

Cold-Finished Steel Bars and Shafting.—The decline in prices does not appear to have ended with the announcement of 2.30c., base Pittsburgh, as the third quarter price, since 2.20c., base, lately has become rather common and no longer is confined solely to the Detroit district. Decreasing demands from the automotive industry have made it necessary for makers to look elsewhere for orders, and competition for business has grown fairly sharp.

Hot-Rolled Flats.—New business in strips, hoops and bands is rather light, but is sufficient with specifications that came in during the latter part of June to provide makers with a fairly good operation. Shipments, however, are at the expense of order books, and a lighter operation appears ahead. Prices are firm.

The Iron Age Composite Prices

Finished Steel

July 12, 1927, 2.367c. a Lb.

One week ago	2.367c.
One month ago	2.367c.
One year ago	2.431c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.339c.,	April 26
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

July 12, 1927, $18.59 a Gross Ton

One week ago	$18.71
One month ago	18.96
One year ago	19.50
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$18.59,	July 12
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.80c. to 1.85c.
F.o.b. Chicago	2.00c.
Del'd Philadelphia	2.12c. to 2.17c.
Del'd New York	2.14c. to 2.19c.
Del'd Cleveland	1.99c. to 2.04c.
F.o.b. Cleveland	1.80c. to 1.85c.
F.o.b. Birmingham	1.95c. to 2.05c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.80c. to 1.90c.
F.o.b. Birmingham	1.95c. to 2.05c.

Rail Steel

F.o.b. mill	1.65c. to 1.80c.
F.o.b. Chicago	1.90c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill	1.75c. to 1.85c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	1.90c. to 2.05c.
Del'd Cleveland	1.99c. to 2.04c.
Del'd Philadelphia	2.07c. to 2.17c.
Del'd New York	2.09c. to 2.19c.
C.i.f. Pacific ports	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.75c. to 1.85c.
F.o.b. Chicago	2.00c.
F.o.b. Birmingham	1.90c. to 2.05c.
Del'd Cleveland	1.99c. to 2.04c.
Del'd Philadelphia	1.92c. to 2.12c.
Del'd New York	1.99c. to 2.14c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.30c.
All gages, 6 in. to 12 in., P'gh	*2.10c.
Nos. 13 and 14 gage, 12 in. to 14 in., P'gh, net	2.30c.
Nos. 15 and 16 gage, 12 in. to 14 in., P'gh, net	2.40c.
All gages, narrower than 6 in., Chicago,	2.40c. to 2.60c.
All gages, 6 in. and wider, Chicago,	2.20c. to 2.50c.

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.20c. to 2.30c.
Bars, f.o.b. Chicago	2.30c.
Bars, Cleveland	2.35c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, under 12 in., f.o.b. P'gh mill	3.25c.
Strips, under 12 in., f.o.b. Cleveland mills	3.25c.
Strips, under 12 in., delivered Chicago	3.55c.
Strips, under 12 in., f.o.b. Worcester mill	3.40c.
Stripsheets, 12 in. and wider, Pittsburgh mill	3.00c.
Stripsheets, 12 in. and wider, Cleveland mill	3.00c.
Stripsheets, 12 in. and wider, del'd Chicago	3.30c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.50 to $2.55
Galvanized nails	4.50 to 4.55
Galvanized staples	3.20 to 3.25
Polished staples	2.95 to 3.00
Cement coated nails	2.50 to 2.55

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.40
Annealed fence wire	2.55
Spring wire	3.40
Galv'd wire, No. 9	3.00
Barbed wire, galv'd	3.20 to 3.25
Barbed wire, painted	2.95 to 3.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.35c.
Nos. 9 and 10, del'd Philadelphia	2.67c.
Nos. 9 and 10, f.o.b. Birmingham	2.35c. to 2.45c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	3.00c.
No. 24, f.o.b. Ch'go dist. mill	3.10c.
No. 24, del'd Philadelphia	3.32c.
No. 24, f.o.b. Birmingham	3.10c. to 3.15c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	4.10c.
No. 24, f.o.b. Pittsburgh, B grade	4.00c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.85c.
No. 24, f.o.b. Chicago dist. mill	3.95c.
No. 24, del'd Philadelphia	4.17c.
No. 24, f.o.b. Birmingham	3.95c. to 4.05c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c. to 3.10c.
No. 28, f.o.b. Chicago dist. mill	3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.25c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.20c. to 4.30c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating I.C.	$11.40
15-lb. coating I.C.	14.45
20-lb. coating I.C.	15.80
25-lb. coating I.C.	$17.30
30-lb. coating I.C.	18.75
40-lb. coating I.C.	20.85

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(½% Nickel, 0.10% to 0.20% Carbon)	$3.00
2300	(3½% Nickel)	$4.15 to 4.25
2500	(5% Nickel)	5.25 to 5.50
3100	(Nickel Chromium)	3.15 to 3.25
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	6.75 to 7.00
3400	(Nickel Chromium)	6.00 to 6.25
5100	(Chromium Steel)	3.20 to 3.30
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.10 to 4.30
6100	(Chrom. Vanad. spring steel)	3.60 to 3.80
9250	(Silicon Manganese spring steel)	3.00 to 3.15
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.10 to 4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.00 to 4.25
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.20 to 3.30
	Chromium Molybdenum spring steel (1.—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	$36.00 to 38.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ⅝ in. and larger	$2.80 to $2.90
Spikes, ½ in. and smaller	2.80 to 3.00
Spikes, boat and barge	3.10
Tie plates, steel	2.35
Angle bars	2.75
Track bolts, ¾ in. and ⅞ in.	3.90
Track bolts, ¾ in. and smaller, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	12
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2½ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

Cold-Rolled Strips.—Specifications on second quarter contracts, supplemented by a fair amount of new business, are keeping the mills going this month at substantially the same rate as last month. But the prospect is for a lower operation, as new business is not keeping pace with shipments and consumers generally have supplies that will enable them to get along for a while with a minimum of fresh purchasing. There is no tendency on the part of makers to attempt fuller mill operations at the expense of prices.

Bolts, Nuts and Rivets.—Makers are maintaining a strong stand on prices, and efforts by buyers to shake them have been unavailing. Business is not active, and prices are not getting a real test. Makers of large rivets take exception to the statement that there is a discount of 2½ per cent for cash on shipments into jobbers' stocks and explain that the 2½ per cent allowed jobbers is a commission for carrying rivets in stock.

Cotton Ties.—The market for this year's cotton ties was formally opened by makers on July 11 at practically the same prices as last year. Against last year's prices of $1.20 per bundle of 45 lb., f.o.b. Gulf ports, and $1.22, f.o.b. Atlantic ports, this year's prices are $1.20 and $1.21 respectively. The schedule this year is $1.20, f.o.b. Galveston, $1.27 out of stock at Vicksburg, Miss., and Memphis, Tenn., $1.20 on direct mill shipments and $1.22 out of stock at New Orleans, $1.21 out of stock at Norfolk, Va., Charleston, S. C., Wilmington, N. C., and Savannah, Ga., and 2c. per bundle less on direct mill shipments. Foreign ties are reported to have been sold for less than these prices, which American makers say are as low as they can go without incurring heavy loss.

Warehouse Business.—No change is noted in the local warehouse steel price schedule, but bars, plates and shapes continue to be subject to shading, especially on orders of a size that some manufacturers will accept for mill shipment. The situation also is a little soft in cold-finished steel bars, makers of which need business badly enough to go after small-lot tonnages. In other directions prices are steady. Business is off considerably from the rate of the four months ended with June, but is still ahead of that of February, which was a dull month.

Coke and Coal.—While moderate-sized lots of spot furnace coke can be bought at less than $3 per net ton at ovens, the production of the operators who are willing to go that low is hardly sufficient for more than fill-in supplies. Consumers who want fair-sized lots are not able to buy at less than $3. One lot of 2000 tons was moved at $3, and $3.10 has been paid for another round-lot tonnage. For shipments running as long as a month, the common quotation is $3.25, the same basis as was generally paid on third quarter and last half tonnages. Spot foundry coke also is holding at recent prices. No considerable activity is noted in the coal market, and with supplies more than ample for wants, there is little strength to prices. The union coal miners' strike appears to be approaching a crisis in southern Ohio, where the operators have offered the men an agreement which calls for recognition of the union, but also for a wage scale comparable to that of November, 1917, or $5 per day for day labor, the setting up of a board of arbitration for the settlement of disputes and means for keeping wages in line with those in non-union districts. The men have rejected the offer, and the operators now plan to reopen the mines July 16 without an agreement with the union. In the Pittsburgh district, the Jones & Laughlin Steel Corporation has successfully opened its No. 6 Vesta mine on an open-shop basis without the necessity of bringing in outside miners. Coal reserves are not dwindling very rapidly, on account of slackened industrial activity, and with non-union capacity not producing to its limit, the union cause looks bad and will continue that way until the supply of coal shortens sufficiently to bring about higher prices.

Old Material.—This market is firmer on the steel works grades. This development is not due to increased interest in supplies on the part of Pittsburgh district consumers, but rather finds its explanation in the strength of outside markets to the west, which is keeping scrap from coming to Pittsburgh. It is safe to say that if a Pittsburgh district mill now came into the market for a round tonnage of heavy melting steel the price would be at least $16, because local dealers have not been successful in getting any of the recent railroad scrap offerings and locally produced industrial scrap is not to be had cheaply enough to be sold for less. But that price is well above what actually has been paid by any of the Pittsburgh district melters, with one exception, this being an Ohio Valley steel maker, who has paid within 25c. a ton of that price for strictly No. 1 railroad steel. Otherwise, $15 has been the ruling price to consumers in this district, and none seems to want material badly enough just now to pay more. The supply situation is rather acute in compressed sheet scrap, and because that grade is so hard to secure, there have been some cases of shipments of heavy melting steel against orders for the former. There also is a firm market in machine shop turnings, but no particular activity or strength in the other grades, and the steel foundry grades actually are weak. Railroad scrap has been bringing high prices. The heavy melting steel in the July list of the Pennsylvania Railroad is reported to have been sold at $15.70, delivered Weirton, W. Va., and $16.10, delivered Canton, Ohio. Dealers rather than consumers have paid these prices, and in general the strength of the outside markets appears to be due more to dealer than consumer activity.

The July scrap list of the Norfolk & Western Railway contains 3920 gross tons.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c. to 3.65c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.60c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.30c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, ¾ in. and smaller, per 100 count	62½ per cent off list
Machine bolts, per 100 count	62½ per cent off list
Carriage bolts, per 100 count	62½ per cent off list
Nuts, all styles, per 100 count	62½ per cent off list
Large rivets, base per 100 lb	$3.50
Wire, black soft annealed, base per 100 lb	2.90
Wire, galvanized soft, base per 100 lb	2.90
Common wire nails, per keg	$2.80 to 2.90
Cement coated nails, per keg	2.85 to 2.95

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:		
Heavy melting steel	$15.00 to	$15.25
Scrap rails	14.00 to	14.25
Compressed sheet steel	14.50 to	15.00
Bundled sheets, sides and ends	13.50 to	14.00
Cast iron carwheels	15.00 to	15.50
Sheet bar crops, ordinary	15.00 to	15.25
Heavy breakable cast		14.50
No. 2 railroad wrought	15.00 to	15.25
Heavy steel axle turnings	13.50 to	14.00
Machine shop turnings	11.50 to	12.00
Acid Open-Hearth Furnace Grades:		
Railroad knuckles and couplers	16.75 to	17.00
Railroad coil and leaf springs	16.75 to	17.00
Rolled steel wheels	16.75 to	17.00
Low phosphorus billet and bloom ends	19.00 to	19.50
Low phosphorus, mill plate	18.50 to	19.00
Low phosphorus, light grade	16.75 to	17.00
Low phosphorus sheet bar crops	18.00 to	18.50
Heavy steel axle turnings	13.50 to	14.00
Electric Furnace Grades:		
Low phosphorus punchings	17.00 to	17.50
Heavy steel axle turnings	13.50 to	14.00
Biast Furnace Grades:		
Short shoveling steel turnings	11.50 to	12.00
Short mixed borings and turnings	10.50 to	11.00
Cast iron borings	10.50 to	11.00
No. 2 busheling	10.00 to	10.50
Rolling Mill Grades:		
Steel car axles	19.00 to	19.50
No. 1 railroad wrought	11.00 to	11.50
Cupola Grades:		
No. 1 cast	15.00 to	15.50
Rails 3 ft. and under	17.00 to	17.50
Malleable Grades:		
Railroad		14.50
Industrial		14.00
Agricultural		13.50

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾-in.	$33.50 to 34.00
Forging, ordinary	39.00 to 40.00
Forging, guaranteed	44.00 to 45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$33.50 to $34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	$33.50 to 34.00

Skelp

	Per Lb.
Grooved	1.80c. to 1.85c.
Sheared	1.80c. to 1.85c.
Universal	1.80c. to 1.85c.

Wire Rods

	Per Gross Ton
*Common soft, base	$43.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $42.50 to $44. Cleveland mill base, $42 to $43.

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.50c.
Iron ore, Swedish, average 66% iron,	9.75c. to 10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.50 to $11.00
	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$3.00 to $3.25
Foundry, f.o.b. Connellsville prompt	4.00 to 4.50
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered	9.59 to 10.77
Foundry, Birmingham	5.50
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.30 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.70 to 1.90
Mine run gas coal, f.o.b. Pa. mines	2.00
Steam slack, f.o.b. W. Pa. mines	1.25
Gas slack, f.o.b. W. Pa. mines	1.40 to 1.50

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$90.00
Foreign, 80%, Atlantic or Gulf port, duty paid	90.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$34.00
Domestic, 16 to 19%	33.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
10%	$34.00	12%	$38.00
11%	36.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
6%	$26.50	10%	$32.00
7%	27.50	11%	34.00
8%	28.50	12%	36.00
9%	30.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	95c. to $1.05
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$17.00 to $18.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	———
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagon	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled threads up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75
F.o.b. Chicago	2.85

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread,	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Orders Placed for 80,000 Tons of Rails—Ingot Output Down to 70 Per Cent

CHICAGO, July 12.—A further recession in the demand for steel is reflected in this week's ingot production, which is not above 70 per cent for the district as a whole. The buying spurt that started late in June and extended into early July has lost momentum, and inasmuch as the bulk of purchasing was at close range, mills are experiencing a rather rapid decline in their obligations. Hot weather is no doubt having its effect on steel output, but this is resulting in little trouble to producers, who find that current specifications are only slightly larger in volume than the percentage of steel-making capacity now engaged.

The trend of automobile production is somewhat uncertain. This is the season when many manufacturers announce new models, which often result in larger sales, as is the case now with one Western motor car company which expects to break all previous July records.

Mill quotations are showing more stability than a week ago in spite of pressure on producers by large users, particularly reinforcing bar dealers, who have cut their warehouse prices to the bone and are looking to steel makers for aid in the form of lower prices.

Of 80,000 tons of standard-section rails placed this week, one order for 65,000 tons is for delivery this year and the remainder, or 15,000 tons, was purchased as a 1928 contract, with the privilege of issuing specifications for a part of the tonnage this year.

Pig Iron.—Shipments of pig iron in this territory are steady, and production remains at the level of the past three weeks. There is a noticeable pickup in spot sales, and several sizable inquiries for third quarter have made their appearance. A melter in northern Indiana is in the market for 4000 tons of malleable and foundry iron, and a user in southwestern Michigan is asking for prices on 5000 tons. In Chicago a definite inquiry has been made for 1300 tons of foundry iron, and a tentative inquiry is out for 500 to 1000 tons. More interest is being taken in the bearing that the coal strike will have on prices, which are reasonably steady at $20, base Chicago furnace. The demand for Southern iron is light, and sales of charcoal iron are few in number. The silvery market is quiet, and carload orders are being taken at the full schedule.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	23.26
Southern No. 2 (barge and rail)	21.43
Low phos., sil. 1 to 2 per cent, copper free	$31.50 to 32.00
Silvery, sil. 8 per cent	33.29
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—Ferromanganese and spiegeleisen are active only in car lots, which are being taken at the ruling prices. Specifications for ferrosilicon are of moderate size.

Prices delivered Chicago: 80 per cent ferromanganese, $97.56; 50 per cent ferrosilicon, $85 to $87.50; spiegeleisen, 18 to 22 per cent, $41.76 to $42.76.

Plates.—Orders for plates are scarce, and local mills, operating at a reduced rate, are able to make prompt delivery on practically any size and weight. Car builders have specified the bulk of the steel required for the Illinois Central cars, and producers are now awaiting orders for material for the 1500 cars that were awarded last week. Orders from the manufacturing trade are small in size but are still fairly numerous. Evidence of interest in oil storage tanks is more pronounced in inquiry, which totals 10,000 tons, than in actual orders from tank builders. Mill prices for plates remain at 2c., Chicago, with the bulk of orders of such small size as to afford no real test of the market.

Mill prices on plates per lb.: 2c., Chicago.

Rails and Track Supplies.—Orders for standard-section rails from two railroads, the Pennsylvania and the Great Northern, total 80,000 tons, of which about 35,000 tons will be rolled in Western mills. The Norfolk & Western is said to be in the market for 60,000 tons of rails, bringing actual inquiry plus that in the making to not less than 120,000 tons. Rail mill operations at Chicago have been cut to 50 per cent of capacity. New business in track supplies totals 23,000 tons, being the requirements for the rails that were purchased this week. Specifications for accessories are in good volume and production is steady.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36 to $38. *Per Lb.:* Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

Structural Material.—Fresh inquiry for fabricated steel totals 5000 tons, in which is included 2200 tons for the Milliners' Building at Chicago. Five projects average about 500 tons each, and their presence in the market affords a more favorable outlook from the viewpoint of the average-sized fabricating shop. Although fabricators as a general rule are not using more than 50 per cent of their rated capacity, a survey recently made indicates that their output in June was only slightly below the average for the corresponding month for the past five or six years. Stocks in the hands of fabricators are only of sufficient size to fill small-tonnage orders. When 50 tons or more are required, a fresh order is usually placed at the mill and lengths are specified so that considerable work is eliminated in the shops. Greater interest is being shown in special shapes, the use of which also results in lessening the amount of work required of the fabricator. The outstanding structural award this week is 1500 tons for a theater in Milwaukee, Wis.

Mill prices on plain material per lb.: 2c., Chicago.

Cast Iron Pipe.—The market is more active, and prices are steady at $34, Birmingham, or $42.20, delivered, for 6-in. and larger diameters. Detroit will close this week for 160 tons of 6-in. Class B pipe and will receive tenders July 18 on 6500 tons of 6-in. and 2500 tons of 36-in. pipe. Glencoe, Ill., has awarded 50 tons of 10-in., 90 tons of 8-in. and 25 tons of 6-in. pipe for a new filtration plant to the Atlas Supply Co., Chicago. Kenosha, Wis., will place an order July 18 for 166 tons of 10-in. pipe and Norwalk, Wis., will buy 200 tons of 6-in. and 60 tons of 8-in. pipe, 15 gate valves and 26 hydrants. Homewood, Ill., will take bids on 330 tons of 6-in. and 165 tons of 8-in. Class C pipe. The lateness of the summer buying movement has resulted in a rapid reduction of makers' backlogs, and deliveries on practically all sizes are prompt.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $42.20; 4-in., $46.20; Class A and gas pipe, $4 extra.

Sheets.—A moderate amount of third quarter contracting in sheets is still under way at 3.15c., delivered Chicago, for black, 4c. for galvanized and 2.40c. for blue annealed sheets. Backlogs average one and one-half weeks, indicating a falling off since the first of the month, and mill operations in this district have dropped to an average of 75 per cent of capacity. Specifications from the stove industry show improvement, but the production of refrigerators is unusually light for this time of the year. Mill deliveries range from two to three weeks, depending on the product.

Prices per lb., delivered from mill in Chicago: No. 24 black, 3.15c.; No. 24 galvanized, 4c.; No. 10 blue annealed, 2.40c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Bars.—Sales, specifications and shipments of soft steel bars are still in good balance, though smaller than at the turn of the month. Specifications from builders of road machinery are in good volume and orders from the agricultural implement trade show little change from the June rate. Demand from the automobile industry and from forgers, while somewhat lighter than in the late spring, is still of fair proportions, and present schedules indicate that shipments to those users will be steady for the remainder of this month. Fresh

orders for mild steel bars are usually individually small and in mixed sizes, and mill prices on business of this kind are steady at 2c., Chicago. Users of iron bars are more actively in the market, but the aggregate of all orders still leaves mills nothing better than hand-to-mouth operations. Although buyers are resisting prices, there is no evidence that iron bars are going for less than 2c., Chicago. A slowing down in the automotive trade has reduced the demand for alloy steel bars, and production in this district now averages 80 per cent of capacity. Price schedules, however, are steady. Specifications for rail steel bars have fallen below shipments for the first time in a number of weeks. Both Chicago Heights mills continue to operate on a double turn basis and, with orders in smaller volume, are now turning their attention to accumulating a stock of fence post material. On the whole, the general manufacturing trade is less active. Producers, however, are looking for the bed industry to pick up, following an exhibition that is now in progress. Rail steel bars are being quoted at 1.90c., Chicago, but buyers' resistance to that price is increasing.

Mill prices per lb.: Soft steel bars, 2c., Chicago; common bar iron, 2c., Chicago; rail steel bars, 1.90c., Chicago.

Hot-Rolled Strip.—Both orders and specifications are in smaller volume. Going prices on small lots range from 2.40c. to 2.60c., Chicago, for all gages narrower than 6 in. and from 2.20c. to 2.50c. for wider strips.

Cold-Rolled Strip.—The demand for this commodity has declined, and mill operations now average 70 to 75 per cent of capacity. Prices for strips under 12 in. wide are 3.25c., Cleveland, or 3.55c., delivered Chicago.

Bolts, Nuts and Rivets.—Specifications for these commodities so far in July are pointing downward, and producers' operations do not average above 60 per cent of capacity. The crop outlook is lending encouragement to agricultural machinery builders, who are now preparing for the late summer and fall trade. Demand from the automobile industry is fair, but the requirements of the railroads have declined. Prices are steady.

Wire Products.—Several weeks of weather favorable to the crops have brought about some improvement in the jobbing trade. Conditions in the Northwest are the best in several years, and indications now are that crops in the lower Mississippi River basin, which was recently flooded, will be late but of fair size. Demand for nails is unusually light, but tests of prices such as can be made in a market of this kind indicate that this product is holding fairly well at $2.60, Chicago. Wire specifications from the manufacturing trade are lighter, and the automobile industry is taking smaller quantities. Mill stocks are of moderate size and are well balanced. A slowing down in trade, combined with hot weather and, in some instances, the need for repairs, has cut the production at wire mills to between 50 and 55 per cent of capacity. Mill prices are shown on page 99.

Reinforcing Bars.—The Sanitary District, Stickney, Ill., is in the market for 2000 tons of reinforcing bars, and a warehouse for the Illinois Bell Telephone Co., Chicago, will take 1000 tons. The Chicago Board of Education announces two new public schools, each taking 165 tons. All told, fresh inquiry totals not less than 4500 tons, including a liberal sprinkling of projects calling for less than 100 tons each. Orders this week total about 1200 tons, including several awards of 300 tons each. As a general thing, construction is going on at a rapid pace and warehouses are being pressed for deliveries. Prices are weak, 2.15c. being the common quotation on billet steel bars out of Chicago warehouses and 2c., delivered Chicago, being the going price on rail steel reinforcing bars. New awards and fresh inquiries are shown on page 114.

Coke.—Shipments of by-product foundry coke are a trifle lighter as a result of curtailed foundry melt because of hot weather. Prices are steady.

Old Material.—A steel mill purchase of heavy melting steel brought $12.50 per gross ton, delivered. Taken as a whole, this market is quiet, sales to users being confined to small lots that usually are for immediate delivery. Dealers continue to cover old orders and for certain grades will pay an advance of 25c. to 50c. above market quotations. A large steel mill purchase of heavy melting steel made this spring is almost covered, and in the absence of further buying there is a growing feeling of uneasiness throughout the trade. Recent purchases of railroad scrap have been heavy. Buyers who have not been able to move cars as they appeared on track have forced the railroads in some instances to resell. Opinions as to the trend of the scrap trade are mixed. It is evident, however, that present market activity is made up almost wholly of brokers' trading against old orders. Where it has been possible, yards have reduced stocks on the ground, and there appears to be little willingness to put scrap down notwithstanding the fact that prices are low. The Rock Island is offering 10,000 tons and the Chesapeake & Ohio will sell 9000 tons.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$12.00 to $12.50
Shoveling steel	12.00 to 12.50
Frogs, switches and guards, cut apart, and miscellaneous rails	13.25 to 13.75
Hydraulic compressed sheets	10.00 to 10.50
Drop forge flashings	9.25 to 9.75
Forged, cast and rolled steel car-wheels	14.25 to 14.75
Railroad tires, charging box size	14.50 to 15.00
Railroad leaf springs, cut apart	14.50 to 15.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	14.25 to 14.75
Coil springs	14.75 to 15.25
Low phosphorus punchings	14.50 to 15.00
Electric Furnace Grades:	
Axle turnings	12.00 to 12.50
Blast Furnace Grades:	
Axle turnings	10.25 to 10.75
Cast iron borings	10.00 to 10.50
Short shoveling turnings	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades:	
Iron rails	13.50 to 14.00
Rerolling rails	14.75 to 15.25
Cupola Grades:	
Steel rails, less than 3 ft	15.00 to 15.50
Angle bars, steel	13.25 to 13.75
Cast iron carwheels	13.50 to 14.00
Malleable Grades:	
Railroad	13.50 to 14.00
Agricultural	13.50 to 14.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb	23.00 to 25.00
*Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	13.50 to 14.00
Iron arch bars and transoms	18.50 to 19.00
Iron car axles	20.00 to 20.50
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.75 to 11.25
No. 1 busheling	9.25 to 9.75
No. 2 busheling	5.75 to 6.25
Locomotive tires, smooth	13.75 to 14.25
Pipes and flues	7.00 to 7.50
Cupola Grades:	
No. 1 machinery cast	14.50 to 15.00
No. 1 railroad cast	13.50 to 14.00
No. 1 agricultural cast	13.50 to 14.00
Stove plate	12.50 to 13.00
Grate bars	11.50 to 12.00
Brake shoes	10.00 to 10.50

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.15c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb	$3.20
Common wire nails, base per keg	$2.85 to 2.95
Cement coated nails, base per keg	2.95

New York

Better Inquiry for Pig Iron—Fabricating Award Calls for 16,000 Tons

NEW YORK, July 12.—The pig iron market is featured by two sizable inquiries calling mainly for fourth quarter delivery. The New York Air Brake Co., New York, is in the market for 2200 tons for its Watertown, N. Y., plant, of which 1200 tons of malleable and 500 tons of foundry are for fourth quarter shipment and 500 tons of malleable is for third quarter. The General Fire Extinguisher Co., Providence, R. I., has issued an inquiry for 2000 tons of No. 1X and No. 2X for fourth quarter. In addition, there are a number of closed inquiries pending that account a total of 3000 to 4000 tons. Small buyers are coming into the market more freely, but are limiting their purchases to current needs. Sales by local brokers during the past week totaled about 7500 tons. The price situation is still weak, although no further changes are reported. As the result of a decision of the Interstate Commerce Commission, freight rates to New York from Virginia furnaces will be reduced to $4.87, a cut of 67c. a ton. Virginia foundry iron is quoted at $21.50, base furnace.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail)	$21.91 to $22.41
No. 2 plain fdy. (by barge, del'd alongside in lighterage limits N. Y. and Brooklyn)	19.50 to 20.00
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	21.39 to 22.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.89 to 23.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	22.39 to 23.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Ferroalloys.—There is a decided absence of both sales and inquiries for ferromanganese and spiegeleisen. Quotations are unchanged but specifications on contract are said to be a little better than a month ago. This applies also to ferrosilicon and ferrochromium. Production of ferromanganese in June was next to the largest for any month this year at 29,232 gross tons, according to blast furnace returns of THE IRON AGE. The June spiegeleisen output of 10,535 tons was also exceeded only by April at 12,907 tons.

Finished Steel.—New business so far this month is not up to the rate of the latter part of June. Locally the situation has been dull since the July 4 holidays. Except for the letting of a building contract requiring 16,000 tons of steel, there has been little business of importance. Keen competition still exists in structural steel, but there is more resistance on the part of the mills to price concessions. On the usual run of orders quotations of 1.70c. and 1.75c., Pittsburgh, are now quite common, with prices even below the lower figure on the larger jobs. The demoralized price situation has been brought about largely, according to some explanations, by the urging of fabricators, who have been taking work at such low prices that they beseech the mills for lower quotations to aid in cutting down their losses. Further weakness in plates is credited also as due to the fabricated steel situation. Concessions first appeared on universal plates, but are now extended to sheared plates, so that the market on sheared plates is now fairly well settled to 1.75c., Pittsburgh, for the larger lots and 1.80c. for small lots. Steel bars remain at 1.80c. to 1.85c., Pittsburgh, but the demand is very light. Sheet prices generally are holding at the new levels, and the same may be said of hot and cold rolled strip steel. Bids on sheets which were opened recently by the New York Central showed that nearly all mills were holding to 3c., Ohio mill, for black, but there was one quotation of 2.85c. Bids on blue annealed and galvanized were uniformly 2.25c. for the former and 3.85c. for the latter. A few scattered sales of automobile body sheets at 4.20c., Pittsburgh, are reported, but the general quotation is 4.25c. Wire nails are still available at $2.50 per 100 lb. keg, notwithstanding the recent advance by some makers to $2.55. Structural steel lettings in the metropolitan district during June, exclusive of bridges, subway work, etc., amounted to 32,000 tons, as reported to the Structural Steel Board of Trade. This compares with 33,550 tons in May and with 40,000 tons in June, 1926.

Mill prices per lb. delivered New York: Soft steel bars, 2.14c. to 2.24c.; plates, 2.09c. to 2.19c.; structural shapes, 1.99c. to 2.14c.; bar iron, 2.14c.

Reinforcing Bars.—The McClintic-Marshall Co. will furnish 500 tons of bars for a factory building in Jersey City. Several other fairly large tonnages have been booked during the last week, and there is an improved demand from road builders. The State of New Jersey will open bids July 18 on a road job requiring

Warehouse Prices, f.o.b, New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard	5.75c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	50 to 50 and 10
1 x 30 in. and smaller	45 to 50
Carriage bolts, cut thread:	
½ x 6 in. and smaller	50 and 10 to 60
¾ x 20 in. and smaller	50 to 50 and 5
Coach screws:	
½ x 6 in. and smaller	50 and 10 to 60
1 x 16 in. and smaller	50 to 50 and 5

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in	$17.33
Seamless steel, 2-in	20.24
Charcoal iron, 2-in	25.00
Charcoal iron, 4-in	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
⅞-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	4	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	4.00c.
No. 22	4.15c.
No. 24	4.20c.
No. 26	4.30c.
No. 28*	4.45c.
No. 30	4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c. to 4.60c.
No. 16	4.45c. to 4.70c.
No. 18	4.60c.
No. 20	4.75c.
No. 22	4.80c.
No. 24	4.95c.
No. 26	5.20c.
No. 28*	5.45c.
No. 30	5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

approximately 800 tons. Estimates are being prepared on several large projects in this territory, which will take 2000 to 3000 tons. Business thus far in July is equal to, if not better than, the volume for the corresponding period last month. Prices are unchanged as follows:

Prices per lb. on billet steel reinforcing bars: From mill, 1.90c., Pittsburgh. Out of New York warehouse, 3.05c. to 3.15c., delivered at job. Out of Youngstown warehouse, 2.40c., Youngstown, or 2.77½c., delivered New York.

Warehouse Business.—Prices continue fairly firm, although demand is light. Structural material is reported to be moving from stock in fair volume, orders occasionally ranging up to as much as 5 tons. Purchasing of black and galvanized sheets is limited to small lots, and a tendency to offer price concessions is still evident. The market on sheets, however, is quotable at 4.20c. per lb., base, on black and 4.95c., base, on galvanized.

Cast Iron Pipe.—Quotations are irregular, and competition for the small volume of current business is keen. Most of the present buying is confined to lots of less than 100 tons. About the only outstanding inquiry in this district is about 20 miles of pressure pipe for White Plains, N. Y. With prices exhibiting their present tendency toward softness, users of pipe are apparently inclined to delay purchases.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $43.25 to $45.25; 4-in. and 5-in., $48.25 to $50.25; 3-in., $58.25 to $60.25; Class A and gas pipe, $4 to $5 extra.

Coke.—The market is quiet, with only small tonnages being purchased for prompt shipment. Standard foundry continues at $4.25 to $4.75 per net ton, Connellsville, and standard furnace at about $3.25, Connellsville. Delivered prices of Connellsville foundry coke are: To northern New Jersey, $8.28 to $8.78; New York or Brooklyn, $9.04 to $9.54; Newark or Jersey City, N. J., $8.16 to $8.66 per net ton. By-product foundry coke is unchanged at $9.59 to $10.77 per net ton, delivered Newark or Jersey City.

Old Material.—The continued weakness of the scrap market is attributed in part to the large quantity of material that is available. In addition to the current accumulations in yards and from manufacturing operations; the railroads have been offering sizable lists. On July 13, the Lehigh Valley, the Delaware, Lackawanna & Western and the Southern railroads opened bids on lists. No. 1 heavy melting steel is inactive, with a Bethlehem, Pa., consumer about the only eastern Pennsylvania mill in the market at present. Buying prices are unchanged at $13.50 per ton, delivered. Heavy melting steel, yard grade, is going forward to consumers in Harrisburg and Pottsville, Pa., with brokers paying $10.50 per ton for this shipment. Short shoveling turnings and borings and turnings are being shipped to Bethlehem, Pa., at $10.25 per ton, delivered. Specification pipe is quiet at $12 per ton, delivered Lebanon, Pa. There is little demand for rails for rolling, and dealers, in many cases, are still shipping them against heavy melting steel orders, being unable to dispose of tonnages to the usual rolling mill consumers.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	6.75 to 7.00
No. 1 heavy breakable cast	10.75 to 12.50
Stove plate (steel works)	8.00 to 8.50
Locomotive grate bars	8.00 to 8.50
Machine shop turnings	6.00 to 6.50
Short shoveling turnings	6.50 to 7.50
Cast borings (blast furnace or steel works)	6.75 to 7.50
Mixed borings and turnings	6.50 to 7.50
Steel car axles	15.75 to 16.25
Iron car axles (nom.)	23.00 to 23.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.25 to 8.75
Forge fire	6.50 to 7.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought, long	10.50 to 11.00
Rails for rolling	10.50 to 11.00
Cast iron carwheels	10.75 to 11.25
Stove plate (foundry)	8.50 to 9.75
Malleable cast (railroad)	10.75 to 11.25
Cast borings (chemical)	12.00 to 13.00

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$14.00 to $14.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	12.50 to 13.00
No. 2 cast (radiators, cast boilers, etc.)	11.50 to 12.00

Cleveland

Summer Lull in Steel Market—Scrap Has Steady Tone

CLEVELAND, July 12.—The condition of the finished steel market indicates the presence of the usual dull summer period. Some consumers who have about cleaned up stocks carried over from the second quarter have placed new orders, but these are not numerous and are for small lots. However, so far this month the volume of business has been about as good as during the corresponding period of June. Some of the consuming industries have slowed down in the past two or three weeks, and this is being reflected in the number and size of their orders. This is particularly true of steel bars and structural material.

A renewed spurt of activity in the building field resulted in the placing of considerable tonnage in the past week. Bids have been taken for the New York Central depot in Buffalo, requiring 10,000 tons. Locally competition continues very keen among fabricators.

The price situation shows little change. Prices are being firmly maintained in this territory at 1.80c., Pittsburgh, for steel bars, plates and structural material. While a price of 1.85c. for small lots has not disappeared, it is less in evidence than a week ago. One Ohio plate mill, while maintaining the regular price in this territory, has found it necessary to go to 1.75c., Pittsburgh, for Eastern shipment. The local mill price on steel bars is unchanged at 1.80c. to 1.85c., Cleveland. Although the wire nail market shows a firmer tone, the price of $2.50, base, Cleveland and Pittsburgh, has not been eliminated.

Pig Iron.—A fair amount of business was taken by Cleveland interests during the week, but it was confined largely to the Michigan and Buffalo territories. Total sales aggregated 24,000 tons. The market in northern Ohio is very dull, most consumers having previously covered for their third quarter requirements. Some foundries are buying from hand to mouth, while a few are covering for the entire last half. However, some producers will not commit themselves beyond the third quarter. Aside from a reported concession to $17.50, furnace, on foundry iron in the Mahoning Valley district, prices are holding at recent quotations. For outside shipment the Cleveland furnace quotation on foundry and malleable iron is $17.50, but this is being shaded and differentials are being waived for delivery to some competitive points. For Cleveland delivery, $18.50, furnace, is being maintained. This makes a delivered price well under that on Valley iron at $17.50, furnace. In Michigan $19 is the more general price, although $18.50 is being named for shipment to some points. Shipping orders, which were cut down late last month, have not got back to the June rate, although some furnaces are shipping as much iron as last month. The Dover furnace of the Hanna Furnace Co., at Dover, Ohio, will go out of blast July 16 for an indefinite period, following the removal of the ingot mold foundry at Dover of the Penn Mold & Iron Co. to Sharpsville, Pa., by W. P. Snyder & Co., the purchasers of the plant.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$19.00
Southern fdy., sil. 1.75 to 2.25	23.25
Malleable	19.00
Ohio silvery, 8 per cent	31.50
Basic, Valley furnace	17.50
Standard low phos., Valley fur	27.50

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—Specifications have come out somewhat more freely this month, now that consumers are getting cleaned up on old stocks. Better demand has enabled the leading local mill to increase operations. There has been a moderate amount of contracting for the quarter at $34 Cleveland and Youngstown, for sheet bars and at $33 for large billets and slabs.

Alloy Steel.—Local demand is more active than last month, due to the placing of some orders in lots up to

100 tons by forge shops doing automobile work. Mill operations continue fair.

Sheets.—New business is very light and is limited to small lots for early shipment. The slowing down of the automobile industry is reflected in mill orders from that source. July so far has brought very little tonnage in specifications from the automotive field. Steel barrel manufacturers have carried over considerable material from the second quarter. In spite of inactivity, there is no disposition by mills to shade prices. Some of the producers have enough tonnage on their books to assure a fair operation for three or four weeks.

Strip Steel.—New business in both hot and cold-rolled strip steel is light. Shipments on second quarter contracts have about all been cleaned up, and mills now have little tonnage on their books. Considerable new business is looked for in the latter part of the month, when present stocks are nearly depleted. Regular quotations are being firmly maintained.

Reinforcing Bars.—Awards include 1500 tons for a Cleveland warehouse. Prices are weak locally, and manufacturers of rail steel bars are making little effort to compete here with local makers of billet steel bars. Rail steel bars are unchanged at 1.65c. to 1.70c., mill.

Warehouse Business.—While the demand is slow, it is holding up to last month. The call for material used in the building industry is light. Steel bars, plates and shapes are firm, and jobbers state that there will be no reduction in prices on these materials. The demand for galvanized sheets has improved materially. Keen competition exists on reinforcing bars, prices of which are irregular.

Iron Ore.—With the recent tying up of boats, the Lake fleet is now operating at about 80 per cent of capacity, but as some of the carriers are ahead on shipments, further curtailment is expected. On July 1 there was 5,050,692 tons of ore on Lake Erie docks, as compared with 4,573,156 tons on the same date a year ago. Receipts at Lake Erie ports during June were 6,010,329 tons, and for the season until July 1 they were 11,712,316 tons, as compared with 9,684,284 tons during the same period last year. Shipments from these ports during June were 4,221,187 tons, and for the season until July 1, 9,326,909 tons, as compared with 8,549,392 tons during the same period last year. Shipments by water to South Chicago and by rail from that port to St. Louis amounted to 88,501 tons up to July 1.

Coke.—Foundries that are under contract are taking shipments in fair volume, but there is very little new demand. Prices are unchanged at $4.25 to $5.35, ovens, for Connellsville foundry coke, the higher price being for premium brands. Heating coke is soft, ranging from $2.50, ovens, for prompt shipment, up to $3 for contract material.

Bolts, Nuts and Rivets.—Specifications for bolts and nuts are light, the volume not being up to last month. Most of the rivet consumers who buy for the quarter have placed contracts at $2.75, but the announcement that consumers who do not usually place contracts will have to pay $3 unless they cover with contracts has not brought much business from these buyers, mostly small consumers, and they have been notified that they will be given until July 15 to enter contracts.

Old Material.—The market has a fairly firm tone considering the very limited demand. Enough scrap is coming out at the prices that have been prevailing recently to fill outstanding orders, which locally are confined to heavy melting steel and blast furnace grades, but no surplus scrap is being forced on the market. Dealers, recalling some previous years when the market has become active in July, are asking higher prices, but some consumers think they will be able to buy at lower prices than are now prevailing. There is some demand for compressed sheet steel in the Youngstown district, for which dealers are paying $14.50.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.50 to $14.00
No. 2 heavy melting steel	13.00 to 13.25
Compressed sheet steel	13.00 to 13.25
Light bundled sheet stampings	11.50 to 12.00
Drop forge flashings	12.50 to 13.00
Machine shop turnings	8.75 to 9.00
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.75 to 14.00
No. 1 busheling	11.50 to 11.75
Pipes and flues	10.00 to 10.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.00 to 16.50
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.25 to 10.50
Mixed borings and short turnings	10.25 to 10.50
No. 2 busheling	10.25 to 10.50
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	12.00 to 12.50
Stove plate	12.00 to 12.50
Rails under 3 ft	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.50 to 16.00
Rails for rolling	16.25 to 16.50

Philadelphia

Pennsylvania Orders 50,000 Tons of Rails —Trade Generally Is Quiet

PHILADELPHIA, July 12.—The Pennsylvania Railroad has ordered 50,000 tons of 100-lb. and 130-lb. rails for delivery over the remainder of the year as specified, the business being divided as follows: 25,000 tons to the Steel Corporation, 22,500 tons to the Bethlehem Steel Co. and 2500 tons to the Inland Steel Co. This is the only business of importance within the week, the whole market having lapsed into so-called mid-summer dullness. Operations of Eastern steel mills have declined, the average now being about 50 to 60 per cent. Although the volume of steel buying for the first nine business days of July has been equal to or slightly ahead of that for the same number of days in June, it has fallen below that of the last week or 10 days of June. The pig iron and scrap markets are exceedingly quiet and business is at a minimum.

Pig Iron.—New York State pig iron is again highly competitive with eastern Pennsylvania iron in this district. Quotations equal to $17, Buffalo, with freight

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 3.00c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-rolled strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.65c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.90
No. 9 galvanized wire, per 100 lb	3.35
Common wire nails, base, per keg	2.90

*Net base, including boxing and cutting to length.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.80c. to 3.00c.
Plates, ⅜-in.	3.00c. to 3.20c.
Structural shapes	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands)	2.70c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅞-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24)	4.35c.
Galvanized sheets (No. 24)	5.20c.
Blue annealed sheets (No. 10)	3.30c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

rates of $3.55 or $4.41 to points in this vicinity, have resulted in business being taken by New York furnaces that ordinarily would go to furnaces of this district. A typical case was a quotation of $21.41, delivered, on Buffalo iron against $21.63, delivered, on eastern Pennsylvania iron, the Pennsylvania furnace having a freight rate of $1.13. Some of the New York State furnaces are making no distinction as to silicon content, waiving the usual extras for silicon higher than 2.25 per cent. Sales of foundry iron have amounted to a few thousand tons in the week, but this scarcely makes up for the falling off in shipments to foundries that had bought iron for third quarter but which are not melting as much as they expected to. It is safe to say that none of the eastern Pennsylvania furnaces has sold as much iron in the past few weeks as it has made. One or two of the principal basic pig iron users have reduced their melt and have postponed the purchase of further supplies.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.26 to $21.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.26
East. Pa. No. 1X	22.26 to 23.26
Basic (delivered eastern Pa.)	20.75
Gray forge	21.00 to 21.50
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	24.50 to 25.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	26.67
Virginia No. 2X, 2.25 to 2.75 sil.	27.17

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $5.17 from Virginia furnaces.

Plates.—Operations of Eastern plate mills are scarcely more than 50 per cent and in some instances have fallen below that figure. It is pointed out that the number of orders is just as large as when the mills were operating at a higher rate, but the size of the orders has dropped considerably, many of them being less than a carload. The usual market quotation is 1.80c., Pittsburgh, but on desirable lots some mills grant a concession of $1 a ton.

Structural Shapes.—There is still a dearth of fabricated steel work and competition among fabricators is keen, but prices of plain material have not declined further, due partly to the resistance of the mills to greater concessions and also to the lack of sizable tonnage. Ordinary lots of shapes are being sold at 1.70c. and 1.75c., Pittsburgh, but dips below those figures are not uncommon when the business is sufficiently attractive. Plans will soon be out for Reading terminal improvements, which will probably take about 10,000 tons or more of steel.

Bars.—Orders for steel bars are light, and mills are running at a reduced rate. Quotations are 1.80c. and 1.85c., Pittsburgh, the latter applying on small lots. Bar iron is quoted at 2.12c., Philadelphia.

Sheets.—Few contracts for sheets have been entered for third quarter, but mills in the East that make sheets are getting sufficient business for an operation of about 50 per cent or better. Prices are apparently being well maintained.

Imports.—Pig iron from India received at Philadelphia last week amounted to 1502 tons, but there were no other pig iron receipts from abroad. Other imports were: 16 tons of steel bars from France and 39 tons from Belgium; 78 tons of structural shapes from Belgium and 90 tons from France; 2000 tons of manganese ore from India; 2573 tons of chrome ore from Portuguese Africa and 1000 tons from Greece.

Old Material.—Although the scrap market is as dull as at any time in the recent past, conditions seem to point to at least a slight degree of recovery some time in the near future. Prices have fallen so low that many dealers decline to ship. In some cases their situation is complicated by the fact that they could not now realize a sufficient amount for their scrap to pay loans which were obtained when market prices were higher. Some scrap is being diverted to the Pittsburgh market, the net for shippers, particularly in New England, being larger in that district than in the East. On the other hand, the demand for scrap is very small, and one of the largest users of open-hearth and blast furnace melting grades is holding up shipments to some plants because of an over-supply and reduced mill and blast furnace operations. Buyers have been able to pick up some grades of distress material at dollars below regular market quotations. There are no mill offers for heavy melting steel, and the most that is obtainable from brokers on old contracts is $13.50 to $14, delivered.

Prices per gross ton, delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.50 to $14.00
Scrap T rails	13.00 to 13.50
No. 2 heavy melting steel	11.50 to 12.00
No. 1 railroad wrought	16.00 to 16.50
Bundled sheets (for steel works)	10.00
Machine shop turnings (for steel works)	10.50
Heavy axle turnings (or equivalent)	12.50 to 13.00
Cast borings (for steel works and rolling mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	15.50
Railroad grate bars	12.50
Stove plate (for steel works)	12.50
No. 1 low phos., heavy, 0.04 per cent and under	18.00 to 18.50
Couplers and knuckles	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
No. 1 blast furnace scrap	10.00 to 10.50
Machine shop turnings (for rolling mill)	10.50 to 11.00
Wrought iron and soft steel pipes and tubes (new specifications)	12.50
Shafting	18.00 to 18.50
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 11.50
Steel rails for rolling	16.00
Cast iron carwheels	15.00 to 15.50
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	15.00 to 16.00

Railroad Equipment

The Chesapeake & Ohio Railroad is inquiring for 30 locomotives.

The Delaware & Hudson has ordered one locomotive from the American Locomotive Co.

The Erie is in the market for 25 steel suburban coaches.

The Chesapeake & Ohio is inquiring for 112 caboose cars.

The Michigan Central has ordered two plow cars from the Rodger Ballast Car Co. They will be built by the American Car & Foundry Co.

The Santa Fe has ordered 10 dining cars, 15 baggage and mail, and 8 buffet library cars from the Pullman Car & Mfg. Corporation.

Stockholders Reject British Empire Steel Reorganization Plan

The reorganization plan for the British Empire Steel Corporation, submitted by Roy M. Wolvin, representing the corporation's management, has failed to obtain the indorsement of 75 per cent of the shareholders required for its adoption, according to announcement made on July 12. It was reported that first preferred shareholders approved the plan, while holders of second preferred and common stock brought about its defeat.

Terminal trackage in the Chicago district totals 7726 miles, or greater than the total mileage of all but a few of the larger railroads of the United States, a survey recently completed by the committee on coordination of Chicago's railroad terminals revealed. The district extends from Waukegan, Ill., to Porter, Ind. Approximately 307 freight trains arrive and 302 depart daily from the Chicago district. A working force of 82,850 is maintained by the 32 operating roads.

The Kelly-Decker-Cleary Co., Produce Exchange Building, New York, has been formed to deal in pig iron, coal, coke, limestone and alloys. A. E. Kelly and W. A. Decker were formerly with the Debevoise-Anderson Co., New York, and L. C. Cleary was of L. C. Cleary & Co., Birmingham, dealers in iron ore and sintered ore. F. C. McCrary, formerly with the Cleary company is with the new organization.

Shipments of electric industrial trucks and tractors in June are reported by the Department of Commerce at 140 units, compared with 106 in May, and with 144 in June, 1926. Of the current shipments, 23 were for export. Twenty of the 117 domestic units were of the tractor type. The first six months showed shipments of 624 domestic units and 71 for export, against 688 domestic units last year and 49 for export.

San Francisco

Ocean Freight Rates on Steel to Be Advanced $3 a Ton on Aug. 1

SAN FRANCISCO, July 9 (*By Air Mail*).—On Aug. 1 ocean freight rates on steel shipped from Atlantic ports via the Panama Canal to the Pacific Coast will be advanced $3 a ton. This advance was announced during the week by most of the leading intercoastal steamship companies. The new rate on structural material, reinforcing bars and plates will be 40c., base, per 100 lb. The usual additional charges for extra lengths, etc., remain unchanged. Whether the Eastern mills will absorb the higher freight rate is not yet known.

Shipments of foreign steel continue to be received. During the week a cargo of 724 tons arrived at this port from Antwerp. Of this amount, 16 tons was nails, 18 tons was rails and 690 tons was made up of angles, plates, bars and channels. In addition a fresh shipment of 2000 tons of English and German coke was unloaded, and 300 tons of pig iron from India is on the dock.

Despite the holiday, both buying and inquiry have shown a slight gain. This has been chiefly apparent with respect to plates and reinforcing bars. The situation generally in regard to prices is unchanged.

Pig Iron.—A local importer has received a fresh shipment of 300 tons of pig iron from India. Regular shipments of Indian iron are now coming in at this port at the rate of about 500 tons a month. It is understood that arrangements have been made for direct shipments from Calcutta to San Francisco. Heretofore, it has been customary for Calcutta cargoes to be shipped to Hong Kong and there transferred to a steamer bound for San Francisco. It is said that the new arrangement will effect a considerable saving in time, and that it will also enable local importers to know more definitely the dates that their cargoes will arrive. Buying is confined to immediate requirements only. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings of fabricated structural steel during the week amounted to about 300 tons, but fresh inquiry calls for approximately 8000 tons, of which 7500 tons is for a bridge in Portland, Ore. The Pacific Telephone & Telegraph Co., San Francisco, is taking bids on 200 tons of shapes and plates for a barge, and an addition to a local department store calls for about 300 tons. Eastern mills continue to quote plain material at 2.35c., base, c.i.f. Coast ports.

Plates.—There has been more activity in this department of the market during the past week than has been the case in nearly a month. Lettings total 1160 tons, and fresh inquiries call for about 1200 tons. Of this amount the largest individual requirement is 900 tons for the Southern Pacific Co., San Francisco. The largest letting of the week, 500 tons for a gas holder for the Southern Counties Gas Co. at Anaheim, Cal., was taken by the Western Pipe & Steel Co., San Francisco. While most of the Eastern mills continue to quote plates at 2.30c., c.i.f. Coast ports, it is understood that they will accept 2.25c. on desirable tonnages.

Bars.—In Ellenburg, Wash., an unnamed bidder has been awarded 1500 tons of reinforcing bars for the Kittitas Canal project, Division No. 3. Other lettings reported increase the total tonnage for the week to about 2000 tons. The largest individual award, locally, 120 tons, for State highway paving work, was taken by the Truscon Steel Co. Two proposed buildings in Los Angeles call for a total of 644 tons. While admitting that prices are subject to the necessities that invariably confront sellers in a buyers' market, local concrete bar jobbers continue to quote as follows: 2.75c. to 2.85c., base, per 100 lb. on lots of 200 tons, and 3c. to 3.10c., base, on less-than-carload lots.

Cast Iron Pipe.—Awards for the week total 1206 tons; fresh inquiry calls for about 500 tons. In Seattle, Wash., the King County Water District, No. 25, placed 225 tons of 2 and 6-in. Class B pipe with an unnamed firm. In San Diego, Cal., 100 tons of 2 and 6-in. Class B pipe was awarded to an unnamed maker through the U. R. Dennis Construction Co., and 881 tons of 6 to 16-in. Class C and No. 150, 200 and 250 centrifugal pipe, was placed with an Eastern producer through the Claude Fisher Co., Los Angeles. San Bernardino, Cal., will open bids July 12 on 361 tons of 4, 6 and 8-in. Class C or No. 250 centrifugal pipe, and San Diego, Cal., will open bids July 14 on 144 tons of 6-in. Class C, and 16-in. Classes A and B, pipe.

Steel Pipe.—Los Angeles has awarded 162 tons of 4-in. standard pipe with the Standard Pipe & Supply Co. of that city.

Rivets.—The Southern Pacific Co., San Francisco, has placed 110 tons of rivets with an unnamed Eastern maker. Prices are fairly steady at $2.75, base, per 100 lb., Pittsburgh or Cleveland, although reports of price shading are not uncommon.

Sheets.—The Kittle Mfg. Co., Los Angeles, is understood to have been awarded a contract by the State of California for automotive vehicle license plates, which will require about 400 tons of black sheets.

Warehouse Business.—Jobbers report sales in fair volume, despite the usual seasonal lull at this time of the year. Prices are unchanged.

Coke.—A local importer received a shipment of 2000 tons of English and German beehive and by-product coke during the week. Buying has fallen off, and quotations are somewhat easier. On German by-product fuel, importers are asking $11.50 to $12 a ton at incoming dock, English by-product is quoted at $12 to $13, and English beehive coke is offered at $16 to $17.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Small angles, ¼-in. and over	3.00c.
Small angles, under ¼-in.	3.40c.
Small channels and tees, ¾-in. to 2¾-in.	3.60c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.75c.
Galvanized sheets (No. 24)	5.35c.
Common wire nails, base per keg	$3.75
Cement coated nails, 100-lb. keg	3.75

Toronto

Pig Iron Melt Heavy—Canadian Pacific Buys 10,000 Tons of Rails

TORONTO, ONT., July 12.—Third quarter buying practically disappeared from the Canadian pig iron markets during the past week. This is due to the fact that the great majority of those who place contracts in advance have covered. Local blast furnace representatives report a good spot demand for foundry and malleable iron in lots ranging from 50 to 100 tons, and also occasional orders for 500 to 600 tons. The latter tonnages are being purchased by the larger consumers who are in a position to take immediate delivery on large tonnages, in this way securing the benefit of water shipments. Several boatloads have already been shipped into the Ontario market from Sydney, N. S., this year, and others are to follow at intervals until the close of navigation. Melters who buy iron as demand dictates are furnishing a steady demand for iron, and it is from these that the bulk of current demand comes. The daily melt is holding up well. Jobbing foundries, sanitary and radiator companies are busy, and implement plants are running close to capacity throughout the Dominion. Canadian steel mills also report continued operations averaging close to capacity. The Dominion Iron & Steel Corporation (British Empire Steel Corporation), Sydney, N. S., which just completed a 15,000-ton rail order for the Newfoundland Government, has secured an order for 10,000 tons of 100-lb. rails from the Canadian Pacific Railway, on which rolling will start at once. This

order will keep the rail mill going for another month. Other orders of a diversified nature have also helped to swell the business on the books of this and other steel companies in Canada. While there has been no change in Canadian pig iron prices during the week, the recent reduction of 50c. per ton in United States quotations puts American pig iron practically on a price parity with the Canadian product in this market.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$24.10
No. 2 foundry, sil. 1.75 to 2.75	24.10
Malleable	24.10
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	26.50
No. 2 foundry, sil. 1.75 to 2.25	26.50
Malleable	26.50
Basic	25.50
Imported Iron at Montreal Warehouse	
Summerlee	36.00
Carron	36.00

Old Material.—A marked decline in business featured this market during the past week. Both local and Montreal dealers report a stagnant market, with consumers showing but passing interest. Future buying has practically disappeared, and the only sales now being made are to a few consumers who have used up their stock holdings and are forced into the market to replenish. The consumption of old material, however, is fairly extensive and as a whole is in excess of that of a year ago. Something of a softening tendency appears to be setting in, and dealers state that present prices are on the weak side, although they have failed to make any revision. Mills and other large consumers in the Hamilton, Ont., district furnish the bulk of new business, and orders against old contracts are continually appearing from this quarter. Trading between dealers has declined owing to the limited resale demand.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$10.50	$9.00
Rails, scrap	11.00	10.00
No. 1 wrought	11.00	14.00
Machine shop turnings	8.00	7.50
Boiler plate	8.00	8.00
Heavy axle turnings	8.50	8.50
Cast borings	8.50	7.50
Steel turnings	8.00	8.00
Wrought pipe	6.00	6.00
Steel axles	15.00	17.00
Axles, wrought iron	17.00	19.00
Per Net Ton		
No. 1 machinery cast	16.00	18.00
Stove plate	10.00	13.00
Standard carwheels	14.00	16.00
Malleable scrap	14.00	14.00

Birmingham

Pig Iron Declines 75c. a Ton—Output for First Half Larger Than Last Year

BIRMINGHAM, July 12.—Business in pig iron has been booked at $17.25 to $17.50 per gross ton, Birmngham, for No. 2 foundry, a decline of 50c. to 75c. a ton. So far the reduction has failed to stimulate buying. Smaller consumers are operating at a steady rate but continue to limit purchases to immediate needs. The larger melters, with the exception of the local radiator plant, are running at a slow pace, with no change for the better in sight. Surplus stocks of foundry iron in furnace yards have shown a slight increase so far this month. The consumption of basic iron has been adversely affected by the decline in steel demand. Ten blast furnaces in Alabama are still producing foundry iron, while eight are making basic and others brands. Two furnaces were blown out last month and one has been banked since then. Production of pig iron in Alabama during the first six months of this year totaled 1,476,506 tons, as compared with 1,442,882 tons for the corresponding period in 1926, a gain of 33,624 tons. The total production in Alabama for 1926 was 2,933,796 tons.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.	$17.25 to $17.50
No. 1 foundry, 2.25 to 2.75 sil.	17.75 to 18.00
Basic	17.25 to 17.50
Charcoal, warm blast	29.00

Rolled Steel.—While there has been no further recession in steel production in this district, plans call for sharper curtailment for a short period, probably two weeks, during which new mill equipment will be installed. At the Ensley works of the Tennessee Coal, Iron & Railroad Co. the placing of a new blooming mill engine will cause a temporary discontinuance of operations. Fabricating shops are still taking considerable plain material, sheets are in fair demand, and wire and nails are moving in larger volume. Some orders for rails for fall delivery have been received. Mill prices are unchanged.

Cast Iron Pipe.—In pressure pipe, production and shipments continue at a steady rate, but new business is light. Prices remain at $34 to $35, Birmingham, for 6-in. and larger diameters. The reported merger of several pipe companies in this section has been denied. The market in soil pipe and fittings is dull.

Coke.—Improved demand for foundry coke has come from Detroit and other Northern centers. Ruling prices are unchanged at $5.50 per net ton, Birmingham, for by-product foundry coke and at $6 for beehive. Coke production is being well maintained except in steel company ovens.

Old Material.—The market is dull and prices are weak. Dealers are encountering no difficulty in accumulating supplies of scrap.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$10.50 to $11.00
Scrap steel rails	12.50 to 13.00
Short shoveling turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Stove plate	13.00 to 14.00
Steel axles	16.00 to 17.00
Iron axles	16.00 to 17.00
No. 1 railroad wrought	11.00 to 12.00
Rails for rolling	13.00 to 14.00
No. 1 cast	14.00 to 15.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.00 to 13.50

St. Louis

Large Reinforcing Bar Awards—Heavy Melting Steel Advances

ST. LOUIS, July 12.—Some melters in this district have closed for a 10-day semi-annual inventory, while the Fourth of July holiday also had an adverse effect on the buying of raw material. Sales by the Granite City maker during the week totaled about 2000 tons, the largest single order being 400 tons for a St. Louis melter. Virtually all of the iron sold was for prompt shipment. Prices are unchanged.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$20.00 to $20.50
Northern No. 2 fdy., delivered St. Louis	22.16
Southern No. 2 fdy., delivered	21.67
Northern malleable, delivered	22.16
Northern basic, delivered	22.16

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Iron and Steel.—The principal business of the week was the award of contracts for more than 3000 tons of reinforcing bars, mostly for municipal projects, to two leading mills in the district. The largest order, 1700 tons for covers for basins for the

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.80c.
Galvanized sheets (No. 24)	5.35c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.60c.
Boiler rivets	3.80c.
	Per Cent Off List
Tank rivets, ¾-in. and smaller	70
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped	60
Hot-pressed nuts, hexagons, blank or tapped	60

local municipal waterworks, went to the Missouri Rolling Mills, while 700 tons for the Public Service building was placed with the Laclede Steel Co. Business with structural fabricators is quiet, and they are buying only small quantities of plain material from the mills. Inquiries from railroads for rails and accessories for the last half of the year have been due for several weeks. Warehouse business is quiet. The National Enameling & Stamping Co. has advanced prices on sheets for delivery in the South to the following basis, f.o.b. Birmingham: Galvanized sheets, 4c., base; black, 3.15c., and blue annealed, 2.40c.

Coke.—With some consumers closed down for semi-annual inventories, the demand for industrial grades of coke is light. Very little business is being done in domestic grades.

Old Material.—Heavy melting steel, heavy shoveling steel and No. 2 railroad wrought are 25c. a ton higher. Dealers are short on these items and have advanced prices to stimulate shipments so that they may cover unfilled orders. Consumers are purchasing lightly, and the buying movement that some dealers expected would follow recent orders for finished products has failed to materialize, as mill stocks have proved sufficiently large to take care of increased requirements. No. 1 machinery cast is off $1 a ton, while the remainder of the list is unchanged. Railroad lists include: Chesapeake & Ohio, 8400 tons; Santa Fe, 4300 tons; Wabash, 300 tons; Chicago & Eastern Illinois, 33 carloads; Chicago, Milwaukee & St. Paul, 60 carloads; Nickel Plate, 38 carloads; St. Louis-San Francisco, 20 carloads; Kansas City Southern, 200 tons; Pullman Co., St. Louis, three carloads.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$11.00 to $11.50
No. 1 locomotive tires	14.50 to 15.00
Heavy shoveling steel	11.00 to 11.50
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	13.00 to 13.50
Railroad springs	13.50 to 14.00
Bundled sheets	8.50 to 9.00
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	9.75 to 10.25
Cast iron borings	9.00 to 9.50
Iron rails	14.00 to 14.50
Rails for rolling	13.75 to 14.25
Machine shop turnings	6.75 to 7.25
Steel car axles	18.50 to 19.00
Iron car axles	23.00 to 23.50
Wrought iron bars and transoms	18.50 to 19.00
No. 1 railroad wrought	12.00 to 12.50
Steel rails, less than 3 ft.	15.50 to 16.00
Steel angle bars	11.75 to 12.25
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	16.00 to 16.50
Railroad malleable	12.00 to 12.50
No. 1 railroad cast	15.00 to 15.50
Agricultural malleable	11.50 to 12.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Cincinnati

Price Cut Widens Competitive Field of Southern Stacks—Melt Declines

CINCINNATI, July 12.—A reduction of 75c. a ton in Southern iron, the price of which now stands at $17.25, base Birmingham, featured the pig iron market in the past week. Two motives are said to have been responsible for the revision of prices applying to the products of both Alabama and Tennessee furnaces. One was the pressure brought to bear by large consumers in the South, and the other was the desire of producers to strengthen their position in border line territory along the Ohio River. The decrease does not give Southern operators an advantage in Cincinnati, because the delivered price of $20.94 is higher than that from Ironton, Columbus or Lake Erie furnaces. However, the new quotations create an appreciable differential favoring makers in the South in reaching such points as Louisville and Evansville. With large stocks on hand to care for consumers' needs in the next few months, the Marting Iron & Steel Co., Ironton, Ohio, has blown out its Marting furnace. This company is about ready to begin making river shipments and expects to deliver some third quarter iron in that manner. Foundry iron from the Ironton district is being held at $19, base furnace, for delivery by water, but the price at the furnace figures back to a lower basis when an all-rail movement is considered. The Buick Motor Co. is reported to have purchased about 4000 tons of 14 to 16 per cent ferrosilicon from an Iowa electric furnace. Sales of foundry iron have consisted chiefly of small lots for third quarter delivery. A southern Ohio melter is inquiring for 1000 tons of foundry iron, while another consumer will buy 500 tons.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89
So. Ohio malleable	$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25	20.94
Alabama fdy., sil. 2.25 to 2.75	21.44
Tennessee fdy., sil. 1.75 to 2.25	21.69
Southern Ohio silvery, 8 per cent	30.39

Freight rates: $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—Demand has tapered off somewhat in the past week, decreased bookings being caused by the curtailment of operations in consuming industries. Buyers are prone to postpone definite action on prospective needs unless necessity demands an immediate decision. In fact, only a few are contracting for their third quarter requirements, preferring instead to purchase small lots of material from time to time. Jobbers are accounting for a fair percentage of the total tonnage being ordered, but they also are conforming to a conservative policy by keeping their stocks down to the lowest point consistent with safety. Mill prices in general are about the same as a week ago. There has been little opportunity to test current quotations on sheets, but it is believed that they are well established. On small tonnages resistance to the present schedule has not been successful, while large consumers are still taking out material on old contracts. Galvanized, blue annealed and black sheets are firm at 3.85c., 2.25c. and 3c., base Pittsburgh, respectively. Sheet mills continue to operate at from 75 to 80 per cent of capacity, and little variation from that rate is anticipated in the next 30 days. Bars are lagging to some extent, with sizable orders bringing 1.80c., base Pittsburgh, and miscellaneous lots, 1.85c. Tank plates and structural steel are unchanged at 1.80c., base Pittsburgh. Fabricators have a fair amount of work on hand, and several important jobs are likely to be awarded before the end of the month. There has been a stiffening in the wire goods market, with common wire nails now selling at $2.55 per keg, base Ironton or Pittsburgh.

Reinforcing Bars.—New billet bars are firm at 1.80c. to 1.85c., base Pittsburgh, and rail steel stock is quoted at 1.70c. to 1.80c., base mill. The contract for about 1500 tons of bars for the new bridge of the Chesapeake & Ohio Railway at Cincinnati will be let within the next week.

Warehouse Business.—The volume of business booked in the past week by local jobbers compares favorably with that in the early part of June. Indications are that sales this month will either equal or fall only slightly behind those of June. Prices are steady and unchanged.

Coke.—Curtailment of foundry operations has been felt by manufacturers of by-product foundry coke, who report a pronounced falling off in specifications since July 1. Those foundries serving the machine tool trade have been especially affected and in many cases are

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 24)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb.	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base 100 lb. keg	2.95
Chain, per 100 lb.	7.55
	Net per 100 Ft.
Lap welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

running only one or two heats a week. Shipments to companies allied with the automotive industry also have decreased somewhat. The movement of beehive foundry coke from the New River and Wise County ovens has been of moderate volume. Prices are firm and unchanged.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, $9.52 to $9.64; Wise County coke, $7.59 to $8.09; New River coke, $10.09 to $10.59. Freight rates: $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—Although sales in the past week have been meager, the market has a better tone. Mills are specifying against current contracts at a fair rate, but demand for foundry grades is exceptionally light. Prices are holding. Among railroad offerings this week are the Wabash, 3300 tons; the Norfolk & Western, 3785 tons; the Southern Railway, 9080 tons, and the Louisville & Nashville, 8900 tons.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$11.50 to $12.00
Scrap rails for melting	12.50 to 13.00
Loose sheet clippings	8.50 to 9.00
Champion bundled sheets	9.50 to 10.00
Cast iron borings	8.50 to 9.00
Machine shop turnings	7.25 to 7.75
No. 1 busheling	9.50 to 10.00
No. 2 busheling	7.00 to 7.50
Rails for rolling	13.50 to 14.00
No. 1 locomotive tires	14.00 to 14.50
No. 1 railroad wrought	11.50 to 12.00
Short rails	17.50 to 18.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	17.50 to 18.50
No. 1 railroad cast	14.50 to 15.00
Burnt cast	8.50 to 9.00
Stove plate	10.00 to 10.50
Brake shoes	10.25 to 11.00
Railroad malleable	12.50 to 13.00
Agricultural malleable	12.00 to 12.50

Buffalo

Pig Iron More Active—Weakness of Scrap Reflected in Price Reductions

BUFFALO, July 12.—Pig-iron producers report a slightly more active week, with some inquiry from the East to enliven the market. The New York Air Brake Co., New York, wants 1700 tons of malleable and 500 tons of foundry for its Watertown, N. Y., plant. There are several 1000-ton inquiries out. One furnace took a total of 4000 tons for the week, with a 900-ton lot of two grades of foundry the outstanding order. On ordinary tonnages the market is holding at $17.50, base local furnace, and on sizable lots $17 can be done with some producers.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00 to $17.50
No. 2X foundry, sil. 2.25 to 2.75	17.50 to 18.00
No. 1X foundry, sil. 2.75 to 3.25	18.50 to 19.00
Malleable, sil. up to 2.25	17.00 to 17.50
Basic	17.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Bars and shapes are in fair demand, with prices still soft. There is a good volume of business in sheets. Mill operations during the week were as follows: Lackawanna works, 70 per cent of capacity; Donner Steel Co., 65 per cent, and Seneca Iron & Steel Co., about 75 per cent. One lot of 100 tons of mesh and bars has been placed with a Buffalo maker, and bids go in this week on 420 tons of reinforcing bars for the New York Central station here. A school calling for 350 tons is also up for figures.

Old Material.—The only important development of the week was the purchase of several thousand tons of No. 1 heavy melting steel by a local interest at a price below $15. There has been a further decline in the prices of some of the other grades. Heavy steel axle turnings, railroad knuckles and couplers, coil and leaf springs, No. 2 busheling, rolled steel wheels, steel car axles and cast iron carwheels are some of the grades affected.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$14.75 to $15.00
No. 2 heavy melting steel	14.00 to 14.25
Scrap rails	14.50 to 15.00
Hydraulic compressed sheets	12.75 to 13.25
Hand-bundled sheets	9.50 to 10.00
Drop forge flashings	12.75 to 13.25
No 1 busheling	13.00 to 13.25
Heavy steel axle turnings	12.75 to 13.25
Machine shop turnings	9.00 to 9.50
Acid Open-Hearth Grades	
Railroad knuckles and couplers	15.75 to 16.25
Railroad coil and leaf springs	12.75 to 13.25
Rolled steel wheels	15.75 to 16.25
Low phosphorus billet and bloom ends	17.00 to 17.50
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	10.75 to 11.00
Blast Furnace Grades	
Short shoveling steel turnings	10.75 to 11.00
Short mixed borings and turnings	10.00 to 10.50
Cast iron borings	10.75 to 11.00
No. 2 busheling	10.00 to 10.50
Rolling Mill Grades	
Steel car axles	15.00 to 16.00
No. 1 railroad wrought	13.00 to 13.50
Cupola Grades	
No. 1 machinery cast	14.25 to 14.75
Stove plate	13.00 to 13.50
Locomotive grate bars	11.00 to 11.50
Steel rails, 3 ft. and under	17.00 to 17.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades	
Railroad	15.50 to 16.00
Agricultural	15.50 to 16.00
Industrial	15.50 to 16.00

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb.	3.90

Boston

Pig Iron Prices Are Unsettled, with Greater Selling Pressure from Buffalo

BOSTON, July 12.—Pig iron prices in New England are unsettled as a result of greater selling pressure by Buffalo furnaces. Not only have prices been cut but silicon differentials have been waived, and it is difficult to ascertain any real base price. No. 2X iron made east of Buffalo, which recently has been held at $19.50 a ton, furnace, has been sold at concessions. No. 2X Buffalo iron has been offered at $21 a ton, delivered, equivalent to practically $16, on cars at furnace. One Buffalo furnace, however, has sold No. 2X at $17.50 and $18, furnace, but most of the iron made in that district and sold here in the past week was on an average basis of $17, on cars, furnace. Virginia, Alabama and western Pennsylvania irons figure in the week's transactions, but tonnages were small and for mixture purposes. Sales aggregated around 5000 tons for third

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	4.05c.
Squares and flats	4.55c.
Toe calk steel	6.00c.

and fourth quarter delivery. Indian iron received in June has been cleaned up at $22 a ton, on dock, for No. 2 plain, $22.25 for No. 2X and $22.50 for No. 1X.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$21.41 to $21.91
Buffalo, sil. 2.25 to 2.75	21.41 to 22.41
East. Penn., sil. 1.75 to 2.25	23.65 to 24.15
East. Penn., sil. 2.25 to 2.75	24.15 to 24.65
Virginia, sil. 1.75 to 2.25	27.42
Virginia, sil. 2.25 to 2.75	27.92
Alabama, sil. 1.75 to 2.25	24.16 to 26.02
Alabama, sil. 2.25 to 2.75	24.66 to 26.52

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.92 from Virginia, $6.91 to $8.77 from Alabama.

Imports.—Receipts of foreign pig iron at this port in June totaled 1848 tons, made up of 500 tons of English, 336 tons of Dutch and 1012 tons of Indian. Imports in May totaled 1027 tons, and in June, last year, 10,557 tons. Imports of ore were 8300 tons last month, which compares with 13,650 tons in May, and 33,396 tons in June, 1926. Last month's receipts were from Africa. Imports of cast iron pipe last month totaled 3381 pieces, contrasted with 3906 pieces in May. Slightly more than 100 tons of steel beams from Antwerp were received in June.

Warehouse Business.—The spurt in buying of steel mill products reported by warehouses previous to July 4 has continued. Competition, however, is growing keener with increased offerings of French and Belgian material at marked concessions from prices on domestic mill products. Quantity differentials recently announced by warehouses on domestic products are not adhered to in all instances. Warehouse prices on direct mill shipments of wire nails, barbed wire, plain wire fence, fence staples and poultry staples have been advanced five points. For instance, wire nails in car lots are now $2.60 per keg, and in less-than-carload lots, $2.85.

Coke.—Shipments of by-product foundry coke by the New England Coal & Coke Co. and the Providence Gas Co. continue to increase, although very slowly. The movement is not due so much to any gain in the New England iron melt as to the fact that reserve supplies built up in April and earlier in anticipation of the coal strike are practically exhausted. New England ovens continue to bill out fuel at $12 a ton, delivered, within a $3.10 freight rate zone. Good Connellsville foundry coke is still offered at $1.50 a ton less, but there are few takers.

Old Material.—Quotations on steel turnings, steel mill borings, mixed borings and turnings and chemical borings are holding, but those on most other kinds of material are 50c. to $1 a ton lower. Average prices offered for long bundled skeleton are $5.50 to $6 a ton, on cars shipping point, but in at least one instance a sale was made in the past week at $5.10. The market for forged scrap and specification pipe is dull. Demand for these materials has evaporated, offerings have increased, and prices are largely nominal. Recent sales include cotton ties at $5.60 a ton, on cars shipping point.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$8.50 to $9.00
Scrap rails	8.00 to 8.50
No. 1 railroad wrought	10.00 to 10.50
No. 1 yard wrought	8.00 to 8.50
Machine shop turnings	5.00 to 5.50
Cast iron borings (steel works and rolling mill)	5.50 to 6.00
Bundled skeleton, long	5.50 to 6.00
Forged flashings	6.00 to 6.50
Blast furnace borings and turnings	5.50 to 6.00
Forged scrap	5.00 to 5.50
Shafting	13.00 to 13.50
Street car axles	14.00 to 14.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	7.00 to 7.50
Rails for rerolling	10.00 to 10.50
Cast iron borings, chemical	10.50 to 11.00

Prices per gross ton delivered consumers' yards:

Textile cast	$15.00 to $15.50
No. 1 machinery cast	14.50 to 15.00
No. 2 machinery cast	12.50 to 13.00
Stove plate	12.00 to 12.50
Railroad malleable	14.50 to 15.00

The New York office of the Pittsburgh Bridge & Iron Works, Pittsburgh, formerly at 2 Rector Street, has been removed to 150 Broadway.

Detroit

Concessions on Bars and Shapes—Alloy Steel Declines—Scrap Stronger

DETROIT, July 12.—Specifications for finished steel have fallen off somewhat as compared with June. The volume of business in the next few weeks will depend on the automotive industry, which is in a spotty condition. Production of the motor cars as a whole has slowed up this month, but the decrease does not appear to be greater than usual at this time of the year. Increased production is not looked for before September. Interest in the industry is centered in the awaited announcement of the Ford Motor Car Co. as to when it will place its new models on the market. It is claimed that considerable motor car buying is being delayed until the Ford models come out and their prices are known. A fairly good business in steel bars is being taken from automobile companies and parts manufacturers. Orders are for current needs and quick shipments are wanted. Consumers as a rule are not buying more than 30 days ahead.

Inquiry in the building field has dropped off, and competition is unusually keen both between mills and fabricators. Awards during the week included 10,000 tons for the new plant of the General Motors Truck Corporation at Pontiac.

While regular quotations are being fairly well maintained, some concessions are reported. On steel bars a price of 1.75c., Pittsburgh, has appeared in one or two cases, but most of the mills are holding to 1.80c. and some good-sized lots have been taken at that price. For small lots 1.85c. is the ruling price. Cleveland mills are factors in the competitive situation. While 1.80c., Pittsburgh, is generally quoted on structural material, sharp mill competition is evidently benefiting fabricators, who claim they can secure concessions on round lots. Plates are quoted at 1.80c., but orders are hardly large enough to test prices. Considerable steel in bars and structural material is being shipped here by water by Buffalo mills.

Alloy Steel.—For northern Ohio, Chicago and Buffalo district mills this city is the center of a highly competitive alloy steel market, and recent round-lot sales have brought out lower prices on nickel chrome steel and some other grades that are used in considerable tonnages. The volume of business is fair.

Sheets.—A fair amount of business is coming from the automotive industry. Consumers are buying from hand to mouth and as a rule are not covering for more than 30 days. The market generally has a firm tone, although concessions to 2.90c., Pittsburgh, are reported on black sheets, and the product of strip mills has become a competitive factor in the blue annealed sheet market. Body sheets are firm at 4.25c., Pittsburgh.

Strip Steel.—Some business in cold-rolled strip steel in small lots is being taken at present prices, which so far appear firm, although the market has not been thoroughly tested. Consumers now have little material carried over on old, low-priced contracts.

Coke.—Local by-product foundry coke is quoted at $9.50, ovens, to Detroit consumers, but for outside shipment this price is being shaded to meet competition.

Old Material.—The market has shown some strength during the past two weeks, with heavy melting and shoveling steel and hydraulic compressed sheets registering advances of 25c. per ton. Some of the mills have been negotiating for tonnage quietly, and a few sales involving considerable tonnage have been consummated. The largest scrap producers in the district have had less tonnage to offer for July delivery, which has been an added strengthening factor.

	Per Gross Ton
Heavy melting and shoveling steel	$12.00 to $13.00
Borings and short turnings	8.25 to 8.75
Long turnings	7.50 to 8.00
No. 1 machinery cast	17.00 to 18.00
Automobile cast	18.50 to 19.50
Hydraulic compressed sheets	11.25 to 11.75
Stove plate	13.50 to 14.50
No. 1 busheling	10.50 to 11.00
Sheet clippings	7.75 to 8.25
Flashings	10.50 to 11.00

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	July 12	July 11	July 9	July 8	July 7	July 6
Lake copper, New York	12.62½	12.62½	12.62½	12.62½	12.62½	12.62½
Electrolytic copper, N. Y.*	12.37½	12.37½	12.37½	12.37½	12.25	12.25
Straits tin, spot, N. Y.	63.50	63.25	....	63.50	63.62½	64.62½
Lead, New York	6.20	6.20	6.20	6.20	6.20	6.30
Lead, St. Louis	5.95	5.95	5.95	5.95	5.95	6.00
Zinc, New York	6.52½	6.52½	6.55	6.55	6.55	6.50
Zinc, St. Louis	6.17½	6.17½	6.20	6.20	6.20	6.15

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, July 12.—No pronounced activity is detected in any of the markets. After a brief spurt of buying, the copper market is inactive but a little stronger. Moderate activity in tin has accompanied falling prices. Buying of lead has been light and quotations have been reduced. Zinc is a little stronger, but there has not been much buying.

Copper.—About the middle of last week a prominent brass manufacturer placed fairly liberal orders for electrolytic copper and removed from the market nearly all the metal available at 12.50c., delivered in the Connecticut Valley. There were also a few other consumers who entered the market. Since then producers in general have been asking 12.62½c., delivered, which appears to be the minimum at which the metal can now be purchased, but there has been very little testing of prices. There has also been a fair amount of export buying, the quotation for which remains unchanged at 13c., c. i. f. Hamburg, the official price of Copper Exporters, Inc. Considerable inquiry in the last few days is noted, but consumers are slow about placing orders and are awaiting the statistics for June, which are expected to be available tomorrow, July 13. The immediate future of the market is more or less dependent on these statistics. There has been some buying of copper for delivery as late as October, and some inquiries for November delivery. Lake copper is quoted at 12.62½c., delivered.

Tin.—Despite the holiday on July 4, sales for the week ended with Saturday, July 9, were fairly large at about 1000 tons. Consumers took about 75 per cent of this, with dealers quite inactive. Spot and July metal is reported in poor demand. An interesting fact is that on July 8 metal for July delivery was about ⅛c. less than for August, but now there is a premium of July over August of about the same amount. Consumers when buying seem to want August-September-October delivery. Prices, which started to decline a few weeks ago, are now at the lowest levels in many weeks. Spot Straits tin today is quoted at 63.50c., New York, which is the lowest price since the latter part of July, 1926. A fair business for today is reported. The decline is due in part to an increase in stocks across the water and to rather poor demand. London prices today are considerably lower than a week ago with spot standard quoted at £282 10s., future standard at £278 15s. and spot Straits at £290 10s. A feature of these quotations is the fact that the spread between spot and future standard is now only about £3 15s., whereas a short time ago the same spread was around £12 to £13 per ton. Arrivals thus far this month have been 2502 tons, with 6101 tons reported afloat.

Lead.—To the surprise of many in the trade the American Smelting & Refining Co. again reduced its quotation on July 7 from 6.30c. to 6.20c., New York, as its contract price. The corresponding quotation in the outside market is quite firm at 5.95c., St. Louis. Lack of animation is the general description of conditions and buying is at a rather low ebb.

Zinc.—Statistics for June showed an increase in stocks of refined metal of about 1800 tons over May, which is not a bullish factor. The market is described by several producers as "sick" and very little business or inquiry is reported. Prime Western zinc was sold yesterday as low as 6.17½c., St. Louis, with

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	65.50c. to 65.50c.
Tin, bar	67.50c. to 68.50c.
Copper, Lake	13.50c.
Copper, electrolytic	13.25c.
Copper, casting	12.75c.
Zinc, slab	7.25c. to 8.25c.
Lead, American pig	7.40c. to 8.40c.
Lead, bar	9.40c. to 10.40c.
Antimony, Asiatic	14.50c. to 15.00c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy	26.00c. to 27.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	42.00c. to 43.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	69.75c.
Tin, bar	71.75c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.25c.
Zinc, slab	8.00c.
Lead, American pig	7.25c.
Antimony, Asiatic	18.00c.
Lead, bar	8.75c.
Babbitt metal, medium grade	21.50c.
Babbitt metal, high grade	75.75c.
Solder, ½ and ½	39.50c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	17.50c. to 18.25c.
Copper, hot rolled	21.25c. to 22.25c.
Copper, cold rolled, 14 oz. and heavier	23.50c. to 24.50c.
Seamless Tubes—	
Brass	22.37½c. to 23.37½c.
Copper	23.25c. to 24.25c.
Brazed Brass Tubes	25.50c. to 26.50c.
Brass Rods	15.25c. to 16.25c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9) casks	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

Lead full sheets were reduced ¼c. on July 8 and are now quoted at 9.75c. to 10c. Mill prices on bronze, brass and copper products have not changed since June 23, and zinc sheets are still holding at the reduction of May 25.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	17.50c.
Copper, hot rolled	21.25c.
Zinc	9.75c.
Lead (full sheets)	9.75c. to 10.00c.
Seamless Tubes—	
High brass	22.37½c.
Copper	23.25c.
Rods—	
High brass	15.25c.
Naval brass	18.00c.
Wire—	
Copper	14.50c.
High brass	18.00c.
Copper in Rolls	20.25c.
Brazed Brass Tubing	25.50c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	18.50c.
Copper, hot rolled	21.25c.
Copper, cold rolled, 14 oz. and heavier	23.50c.
Zinc	11.00c.
Lead, wide	10.00c.
Seamless Tubes—	
Brass	23.87½c.
Copper	24.75c.
Brazed Brass Tubes	27.75c.
Brass Rods	15.25c.

some business at 6.15c., but today the market is generally quoted at 6.17½c., with very little buying up to today to test the actual level. A fair business is reported for today.

Antimony.—Lack of demand has resulted in lower prices and Chinese metal for spot delivery is quoted at 11.75c., duty paid, New York, with futures at 12.25c. to 12.50c. It is rumored from rather reliable sources that the Chinese Government, having control of the district where antimony is produced, may gain further control over exports of the metal as a matter of revenue, thus advancing the export duty at present prevailing.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c. per lb., with shot nickel at 36c. and electrolytic nickel at 39c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted in wholesale lots at 25c. to 26c. per lb., delivered.

Non-Ferrous Metals at Chicago

JULY 12.—This market is unusually dull and the prices of tin and lead are lower. There is little interest in antimony and the price is weak. The old metal market is listless and prices are nominal.

Prices, per lb., in carload lots: Lake copper, 12.75c.; tin, 65c.; lead, 6.10c.; zinc, 6.30c.; in less-than-carload lots, antimony, 13.50c. On old metals we quote copper wire, crucible shapes and copper clips, 9.75c.; copper bottoms, 8.75c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 4.75c.; zinc, 3.50c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 13.25c.; all being dealers' prices for less-than-carload lots.

REINFORCING STEEL

Awards of 11,000 Tons and New Projects Up for Bids Total 8000 Tons

Included in 11,000 tons of awards of concrete reinforcing steel were three of fair size: 2150 tons for municipal waterworks at St. Louis; 1500 tons for a canal project at Ellensburg, Wash., and 1500 tons for a warehouse in Cleveland. Inquiries of 8000 tons include 2000 tons for sewage work at Stickney, Ill., and 1000 tons for a warehouse in Chicago. Awards follow:

CLEVELAND, 1500 tons, May Co. warehouse, to Bourne-Fuller Co.

CLEVELAND, 170 tons, Charity Hospital, to Bourne-Fuller Co.

CHICAGO, 240 tons, building for Wieland Dairy Co., to Truscon Steel Co.

KENOSHA, WIS., 150 tons, school, to Truscon Steel Co.

CAMBRIDGE, MASS., 100 tons, warehouse addition, to Kalman Steel Co.

GREENWICH, CONN., 100 tons, road work, to Concrete Steel Co.

FORT LEE, N. J., 400 tons, foundations for New Jersey piers, Hudson River bridge, to Buffalo Steel Co.

JERSEY CITY, 500 tons, building for Yale Electric Co., to McClintic-Marshall Co.

STATE OF NEW JERSEY, 425 tons, road work, 125 tons to Concrete Steel Co. and 300 tons from Salmon Brothers, general contractors, to Fireproof Products Co.

NEWARK, 100 tons, foundations for New York Telephone Co. building, to Igoe Brothers.

UNION CITY, N. J., 250 tons, factory building for Yardley & Co., Ltd., 150 tons, and factory for Schwarzenbach, Huber & Co., 100 tons, to Joseph T. Ryerson & Son, Inc.

UNIONTOWN, PA., 100 tons, Fayette County building, to Electric Welding Co.

BUFFALO., 100 tons, Children's Hospital, to a local maker.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	11.00c.	12.25c.
Copper, heavy and wire	10.75c.	11.75c.
Copper, light and bottoms	9.25c.	10.50c.
Brass, heavy	7.00c.	8.50c.
Brass, light	5.50c.	7.00c.
Heavy machine composition	8.75c.	10.125c.
No. 1 yellow brass turnings	7.50c.	8.25c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	5.00c.	5.50c.
Lead, tea	4.00c.	4.25c.
Zinc	4.00c.	4.25c.
Sheet aluminum	13.50c.	15.50c.
Cast aluminum	13.50c.	15.50c.

GARY, IND., 250 tons, Gary Bank Building, to Kalman Steel Co.

JOLIET, ILL., 200 tons, manufacturing plant, to American System of Reinforcing.

KANKAKEE, ILL., 200 tons, Volkmann Building, to Truscon Steel Co.

CHICAGO, 350 tons of rail steel, apartment building on Pratt Boulevard, to Inland Steel Co.

CHICAGO, 600 tons, Dorchester Apartments, to Kalman Steel Co.

SPRINGFIELD, ILL., 140 tons of rail steel, State road work, to Calumet Steel Co.

STERLING, ILL., 100 tons, bank building, to Concrete Engineering Co.

MILWAUKEE, 250 tons, elevator for L. Teweles Seed Co., to American System of Reinforcing.

ST. LOUIS, 2150 tons, cover for basins for municipal waterworks at Baden and Bissel's Point, 1700 tons; Metropolitan Police Headquarters building, 350 tons, and Delmar Avenue viaduct over Wabash Railway, 100 tons, to Missouri Rolling Mills.

ST. LOUIS, 915 tons, Municipal Public Service Building, 700 tons; Vesper-Buick Auto Co., addition to service building, 115 tons; Firestone Tire Co., store building, 100 tons, to Laclede Steel Co.

ELLENSBURG, WASH., 1500 tons, for the Kittitas Canal project, division No. 3, to an unnamed bidder.

OAKLAND, CAL., 100 tons, Key Route sewer, to an unnamed San Francisco jobber.

OAKLAND, 100 tons, apartment building, Lake and Madison Streets, to Badt-Falk & Co., San Francisco.

SACRAMENTO, CAL., 120 tons, State highway work between La Moine and Shothill Creek, to Truscon Steel Co., San Francisco.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BROOKLYN, 700 tons, factory building for Mergenthaler Linotype Co.; general contract not let.

POUGHKEEPSIE, N. Y., 400 tons, flooring and abutment rests for Mid-Hudson Bridge, Scott Brothers Co., Rome, N. Y., sub-contractor.

STATE OF NEW JERSEY, 800 tons, road work; bids to be opened July 18.

BUFFALO, 420 tons, New York Central passenger station; bids this week.

CHICAGO, 165 tons, public school at Seventy-eighth Street and Lincoln Avenue.

CHICAGO, 165 tons, public school at Fifty-eighth and Turner Streets.

CHICAGO, 240 tons, building for Weiland Dairy Co.; Matt Rauen, general contractor.

CHICAGO, 265 tons, Roosevelt Road viaduct; M. E. White Co., general contractor.

CHICAGO, 1000 tons, warehouse for Illinois Bell Telephone Co.; Holabird & Roche, architects.

CHICAGO, 450 tons, Lake Shore Towers Apartments; Carl E. Ericson, general contractor.

STICKNEY, ILL., 2000 tons, sanitary district sewage treating plant; Forschner Construction Co., general contractor.

CENTRALIA, ILL., 100 tons, pumping station.

DAVENPORT, IOWA, 100 tons, sewage station.

LOS ANGELES, 330 tons, hotel, 960 West Sixth Street; Arthur Bard Co., Los Angeles, general contractor.

LOS ANGELES, 314 tons, bridge over La Canada del Alise at Fourth and Lorena Streets; bids Aug. 1 by the municipal board of Public Works.

PANAMA CANAL ZONE, 650 tons, for delivery at Cristobal or Balboa; bids to be submitted to general purchasing officer Panama Canal, July 27.

FABRICATED STRUCTURAL STEEL

16,000 Tons for New York Office Building and 10,000 Tons for Motor Truck Plant

Awards of structural steel exceeding 51,500 tons include 16,000 tons for a New York office building and 10,000 tons for a motor truck plant at Pontiac, Mich. New projects under negotiation total about 36,000 tons, those of outstanding size being 7500 tons for a bridge at Portland, Ore., and 5000 tons for a hotel addition in Pittsburgh. Awards follow:

BANGOR & AROOSTOOK RAILROAD, 375 tons, bridge, to an unnamed fabricator.

NEW YORK, 2250 tons in the following wards as reported to the Structural Steel Board of Trade, Inc.: Lenox Settlement House, 323 East Seventieth Street, to Shoemaker Bridge Co.; nurses' school, Lincoln Hospital, 141st Street and Southern Boulevard, to Levering & Garrigues Co.; machine shop for Grasselli Dyestuff Corporation at Grasselli, N. J.; column cores for factory building at 651 Eleventh Avenue, machine shop for Brooklyn Union Gas Co., Brooklyn, and column cores for Cadillac service building at Sixty-second Street and Columbus Avenue, to McClintic-Marshall Co.

NEW YORK, 1010 tons, auto service building, 239-245 West Sixty-sixth Street, 500 tons, and apartment building, 79 East Seventy-ninth Street, 510 tons, to Easton Structural Steel Co.

NEW YORK, 200 tons, apartment building, 204th Street and Grand Concourse, to Alpha Iron Works.

NEW YORK, 100 tons, apartment building, 124 Goerck Street, to Dreier Iron Works.

NEW YORK, 1600 tons, addition to St. Regis Hotel, to Hay Foundry & Iron Works.

NEW YORK, 16,000 tons, Chanin Building, Lexington Avenue and Forty-second Street, to Levering & Garrigues Co.

BROOKLYN, 225 tons, Masonic Temple at Kings Highway and Thirty-second Street and Kresge Store at Montclair, N. J., to Lider Structural Steel Co., 452 Lexington Avenue, New York.

YONKERS, N. Y., 250 tons, distributing station for R. H. Macy & Co., to Belmont Iron Works.

MOUNT VERNON, N. Y., 100 tons, garage, to Dreier Iron Works.

NEW BRUNSWICK, N. J., 275 tons, hospital, to American Bridge Co.

ELIZABETH, N. J., 500 tons, hotel, to Albert Smith & Sons, Inc.

KEARNY, N. J., 1500 tons, building for Public Service Corporation of New Jersey, to Bethlehem Steel Co.

JERSEY CITY, N. J., 900 tons, Labor National Bank, to Hinkle Steel Construction Co.

JERSEY CITY, 500 tons, building for Young Men's Hebrew Association, to Oltmer Iron Works.

NORFOLK & WESTERN RAILROAD, 1200 tons, runways, 1000 tons, and bridge, 200 tons, to Virginia Bridge & Iron Co.

SOMERSET, PA., 150 tons, County administration building, to Jones & Laughlin Steel Corporation.

PHILADELPHIA, 240 tons, Pennsylvania Railroad bridge over Gray's Ferry Road, to Harris Structural Steel Co.

CHICAGO, 135 tons, apartment building at Ogden and Adams Streets, to Midland Structural Steel Co.

BUFFALO, 375 tons, Children's Hospital, to Buffalo Structural Steel Co.

PITTSBURGH, 275 tons, tipples for Pittsburgh Coal Co. at Whitfett and Smithdale, Pa., to Bollinger Andrews Construction Co., Pittsburgh.

GLASSPORT, PA., 100 tons, addition to plant of Copperweld Steel Co., to Guibert Steel Co.

CUMBERLAND, MD., 100 tons, bakery, to Guibert Steel Co.

CLARKSBURG, W. VA., 200 tons, Rolland Glass Co. building, to Guibert Steel Co.

PITTSBURGH, 300 tons, Pythian Temple, to McClintic-Marshall Co.

PONTIAC, MICH., 10,000 tons, factory buildings and power house for General Motors Truck Corporation, to Mahon Structural Steel Co.

ANN ARBOR, MICH., 680 tons, University of Michigan athletic building, to Massillon Bridge & Structural Co.

PORT HURON, MICH., 300 tons, 14 steel towers for Grand Trunk Railway System, to Flint Structural Steel Co.

DETROIT, 300 tons, Michigan Steel Corporation sheet mill extension, to Jones & Laughlin Steel Corporation.

TOLEDO, OHIO, 925 tons, Willys-Overland Co. plant extension, to American Bridge Co.

CLEVELAND, 2000 tons, wings to public auditorium, to Forest City Structural Steel Co.

PORTSMOUTH, OHIO, 708 tons, Masonic Temple, to Massillon Bridge & Structural Co.

BARBERTON, OHIO, 465 tons, Pittsburgh Plate Glass Co. plant extension, to Lackawanna Steel Construction Co.

CINCINNATI, 200 tons, caissons for Chesapeake & Ohio Railway bridge, to St. Louis Structural Steel Co.

LOUISVILLE, KY., 700 tons, transmission towers for Kentucky Utilities Co., to American Bridge Co.

NASHVILLE, TENN., 2900 tons, Davidson County bridge, spans 1350 tons, to American Bridge Co.; approaches, 1550 tons, to McClintic-Marshall Co.

MILWAUKEE, 825 tons, new Browning, King & Co. store, theater and office building, to Milwaukee Bridge Co.

RACINE, WIS., 600 tons, new Washington High School, to Lakeside Bridge & Steel Co.

MENASHA, WIS., 125 tons, wood room for Kimberly-Clark Co., to Lakeside Bridge & Steel Co.

ST. LOUIS, 210 tons, two towboats and two barges for Standard Unit Navigation Co., to Nashville Bridge Co.

ST. LOUIS, 350 tons, ice cream plant for Pevely Dairy Co., to American Bridge Co.

HOQUIAM, WASH., 300 tons, tank work for Union Oil Co., to Western Pipe & Steel Co., San Francisco.

MONTEREY, CAL., 360 tons, 500,000-cu. ft. capacity gas holder, for the Pacific Gas & Electric Co., to Western Pipe & Steel Co.

ANAHEIM, CAL., 500 tons, 1,000,000-cu. ft. capacity gas holder, for the Southern Counties Gas Co., to Western Pipe & Steel Co.

SAN FRANCISCO, 160 tons, apartment building, Pacific and Filmore Streets, to Golden Gate Iron Works.

Structural Projects Pending

PROVIDENCE, R. I., 200 tons, State bridge.

BRIDGEPORT, CONN., 1000 tons, National Bank Building.

SPRINGFIELD, MASS., 650 tons, apartment building.

NEW YORK, 1180 tons, office building, Fifty-seventh Street and Sixth Avenue.

NEW YORK, 725 tons, office building for Warner Brothers at 321 West Forty-fourth Street.

NEW YORK, 600 tons, office building at 25 West Fifty-sixth Street.

NEW YORK, 300 tons, bath houses at 121 West Forty-sixth Street.

NEW YORK, 250 tons, office building at 1 West Fifty-second Street.

NEW YORK, 250 tons, building for Columbia University at 125 West 123rd Street.

BROOKLYN, 125 tons, bank building at 860 Washington Avenue.

BROOKLYN, 500 tons, service building for Borden's Farm Products Co., Inc., Avenue G and Forty-ninth Street.

YONKERS, N. Y., 400 tons, apartment building, Valentine Lane.

NEWARK, N. J., 550 tons, insurance building.

ELIZABETH, N. J., 320 tons, office building.

BALTIMORE & OHIO RAILROAD, 400 tons, bridges.

PENNSYLVANIA RAILROAD, 325 tons, bridge at Terre Haute, Ind.

LANCASTER, PA., 500 tons, Pennsylvania Railroad station.

PHILADELPHIA, 1000 tons, loft building for Manufacturers' Exchange.

PHILADELPHIA, 350 tons, apartment building at Sixty-ninth and Market Streets.

PHILADELPHIA, 150 tons, administration building for North Broad Street subway.

BUFFALO, 750 tons, city courts building, general contract awarded to Mosier & Summers.

ERIE, PA., 700 tons, Ford Hotel; bids taken.

TORONTO, ONT., 1000 tons, Ford Hotel; bids taken.

JAMAICA, L. I., 850 tons, Title Guarantee Bank Building.

STATE OF NEW YORK, 300 tons, highway bridges.

FLINT, MICH., 150 tons, store building for S. S. Kresge Co.

LANSING, MICH., 1600 tons, factory building; owner's name not announced.

PITTSBURGH, 150 tons, Regent Square School.

PITTSBURGH, 5000 tons, William Penn Hotel extension.

PITTSBURGH, 400 tons, Monongahela Bank Building.

COLUMBUS, OHIO, 800 tons, Columbus Business Building.

WILMINGTON, OHIO, 150 tons, hotel.

MUNCIE, IND., 500 tons, hospital.

LOUISVILLE, KY., 700 tons, theater.

CHICAGO, 2200 tons, Milliners' Building.

GARY, IND., 400 tons, store building.

STERLING, LA., 600 tons, power house.

DULUTH, MINN., 625 tons, coal bridge for Mead, Morrison Mfg. Co.

MOSCOW, IDAHO, 400 tons, building for University of Idaho.

PORTLAND, ORE., 7500 tons, Morrison Street bridge; bids to be called soon.

SAN FRANCISCO, 900 tons, plates for Southern Pacific Co.; bids being taken.

SAN FRANCISCO, 200 tons, plates and shapes for a barge for Pacific Telephone & Telegraph Co.; bids being taken.

SAN FRANCISCO, 300 tons, addition to building for I. Magnin & Co., Geary Street and Grant Avenue; McDonald & Kahn, general contractors.

PANAMA CANAL ZONE, 365 tons, Mount Hope warehouse, for delivery at Cristobal or Balboa; bids to be submitted to general purchasing officer, Panama Canal, July 25.

PERSONAL

J. C. Gore, assistant sales manager for the St. Louis Gas and Coke Corporation, formerly St. Louis Coke & Iron Corporation, Chicago, has been transferred to the corporation's St. Louis office, where he will have charge of sales. He became general sales agent at the company's Chicago office when it was opened in 1923, and when the general offices were moved there he was made assistant sales manager. Previously he had been connected with Domhoff & Joyce, first at Indianapolis for nine years and then as manager of their Chicago office for four years.

J. C. GORE

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Paul D. Cravath, for many years general counsel of the Westinghouse Electric & Mfg. Co., East Pittsburgh, has been elected acting chairman of the company, succeeding the late Guy E. Tripp. A resolution has been adopted authorizing the nomination of a permanent chairman.

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E. W. Beadel, formerly president of the Pennsylvania Engineering Works, New Castle, Pa., has just returned from South America where for two and one-half years he has represented the Bethlehem Steel Co. in the capacity of vice-president on a special mission in charge of constructing an oil refinery for the Argentine Republic.

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G. W. Craighead has been appointed district representative in eastern Michigan for the Foote Brothers Gear & Machine Co., 215 North Curtis Street, Chicago, and will have headquarters at General Motors Building, Detroit. A. H. Tischer, formerly in the development engineering department of the company, has been made sales representative in southern Chicago and adjacent suburbs, including northern Indiana.

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A. L. Hollinger, for some years in charge of the Chicago office of the Surface Combustion Co., New York, has been made manager of the company's Pittsburgh office, effective July 15, where he will succeed F. J. Winder. Mr. Winder has been made assistant to the general manager in charge of fuel for the Allegheny Steel Co., Brackenridge, Pa. G. B. Ruby will succeed Mr. Hollinger at Chicago. O. R. Olsen, formerly associated with the W. N. Best Corporation, New York, and more recently with a furnace company in the Midwest, has also joined the Pittsburgh staff of the Combustion company.

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E. H. Hawkins, divisional purchasing agent at New York for the E. I. duPont deNemours Co., was elected president of the Purchasing Agents' Association of New York at its annual meeting held recently.

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Burton L. Delack, assistant manager of the Schenectady works, General Electric Co., has been appointed acting manager, succeeding C. E. Eveleth, who was recently made a vice-president. Edward A. Wagner, formerly of the Fort Wayne works but for the last year managing engineer in charge of all distribution transformers with headquarters at Pittsfield, has been made acting manager of the Pittsfield works to succeed C. C. Chesney, who has been made a vice-president in charge of manufacturing. Giuseppe Faccioli, works engineer of the Pittsfield works, has been made associate manager and works engineer at that plant.

L. K. Townsend, who has been district representative in Indiana, with headquarters at Indianapolis, for the Pittsburgh Crucible Steel Co., Pittsburgh, has been appointed Cleveland district sales manager and will have charge of sales of the company in Ohio and Indiana. Mr. Townsend, who succeeds T. A. Goodridge, recently appointed manager agricultural division Crucible Steel Co. of America, with headquarters at Chicago, was with the Central Alloys Steel Corporation before joining the Pittsburgh Crucible Steel Co. a little more than a year ago.

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John W. Meaker whose resignation as general manager of the Cyclone Fence Co., Waukegan, Ill., was announced in THE IRON AGE of July 7, was first associated with his father in the Meaker Mfg. Co., Chicago. This company moved its plant to North Chicago, Ill., and was later sold to the Fansteel Products Co. Mr. Meaker then took a clerical position with the American Steel & Wire Co. He served in practically all sales departments of that organization and for two years was in charge of the St. Louis sales office. Upon his return to Chicago he was appointed manager of the fence and post sales department, a position which he held for 12 years. James H. Kinney, formerly general sales manager for the Cyclone company, has been appointed general manager, succeeding Mr. Meaker. H. G. Chapman, the company's New York sales manager, has been appointed general sales manager with headquarters at Waukegan.

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James M. Dunbar, until recently associated with the Boston office of Rogers Brown & Crocker Brothers, Inc., will sail for Scotland July 16, for several weeks stay.

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Stanley S. Boyer has been elected vice-president and general manager of the Herbrand Co., Fremont, Ohio, maker of small tools and forgings, succeeding A. J. Farrabaugh, who has resigned. Alphonse J. Barth has succeeded Mr. Boyer as secretary-treasurer.

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Ollie M. Butler, Ennis, Tex., for the past two years trade commissioner in charge of the Department of Commerce office at Manila, P. I., has been appointed manager of the Detroit branch of the Bureau of Foreign and Domestic Commerce.

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F. K. Armstrong, recently connected with the New York sales branch of the Ingersoll-Rand Co., 11 Broadway, New York, has been placed in charge of the branch office recently opened by the company at 236 High Street, Newark, N. J., to serve the company in northern New Jersey and the adjacent counties of New York.

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Major Victor E. Edwards, vice-president Morgan Engineering Co., Alliance, Ohio, had the degree of Doctor of Engineering conferred upon him at the graduation exercises of the Worcester Polytechnic Institute, Worcester, Mass., on June 20.

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Verner R. Velander, secretary and treasurer of the Pittsburgh Engineering Foundry & Construction Co., Pittsburgh, has sold his interest in that company and organized the Verner Steel Products Co. with headquarters in Chicago.

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J. W. Skinkle, recently signaling sales manager for the Graybar Co., Inc., New York, has been appointed superintendent of the new specialty products shop at the Hawthorne Works of the Western Electric Co., Chicago.

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Alfred O. Blackman, recently superintendent of power and plants for the Yale & Towne Mfg. Co., Stamford, Conn., has engaged in consulting engineering work in New York in association with Bernhardt E. Muller.

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W. F. Hart, who, as announced in THE IRON AGE last week, has been placed in charge of sales in the pipe and tube departments of the Bethlehem Steel Co., was for several years president of the Verona Tool Works, Verona, Pa. He entered the steel business in the accounting department of the National Tube

Co., and was for a number of years associated with the Central Tube Co., Pittsburgh. R. Duncan Morris, who has also become identified with the pipe and tube sales departments of the Bethlehem company, was connected for more than 20 years with Spang, Chalfant & Co., Inc., Pittsburgh, starting as an office boy and finally becoming general manager of sales. More recently he has been assistant manager of the pipe sales division, Wheeling Steel Corporation, Wheeling, W. Va.

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R. J. Doty, vice-president and chief operating executive during the past eight years for the Sivyer Steel Casting Co., Milwaukee, has resigned, effective Aug. 1. Mr. Doty will devote his time for several months to private interests and it is expected that it will be possible for him to resume by next spring, in some other corporation, activities with which he has long been identified.

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Dean Elmer A. Holbrook, of the school of mines and metallurgy, Pennsylvania State College, has resigned and on Sept. 1 will become dean of the combined engineering and mining school of the University of Pittsburgh. He is a graduate of the Massachusetts Institute of Technology. For a time he was in charge of the Pittsburgh laboratories of the Bureau of Mines, and prior to his association with the State College he was acting head of the Bureau of Mines.

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John A. Topping, chairman Republic Iron & Steel Co., will sail July 23 on the Homeric for a few weeks' touring of England and Scotland.

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C. A. Alexander, general manager Tata Iron & Steel Co., India, arrived June 24 for a three months' stay in the United States and may be reached through Perin & Marshall, consulting engineers, 40 West Fortieth Street, New York. F. K. Bennett, consultant on mills and mill operations of the Tata company, began a stay of some weeks on July 5 and E. A. Proctor, chief works engineer, is en route from India.

OBITUARY

ALEXANDER T. DRYSDALE, manager of the Dundalk, Md., plant of the Central Foundry Co., New York, whose death occurred at Baltimore on May 6, was born at Louisville, Ky., in 1861 and began his career with Snead & Co. Iron Works of that city. In 1884 he became draftsman and foreman of the pattern shop of Dennis Long & Co., continuing in that capacity after the company's merger with the United States Cast Iron Pipe & Foundry Co. He became manager of the Sheffield Cast Iron Pipe & Foundry Co. in 1905 and in 1909 was made superintendent at Dundalk, Md., for the Central Foundry Co., remaining until 1912 when he returned to the Sheffield company. In 1916 he went to the Burlington, N. J., works of the United States Cast Iron Pipe & Foundry Co. and afterward to its North Birmingham plant. Later he was placed in charge of the Bessemer, Ala., works of the Central company, remaining there until his transference to the Maryland plant in 1921.

A. T. DRYSDALE

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RUDY GINGERY, superintendent Wheeling Mold & Foundry Co., Wheeling, W. Va., for the past 21 years, died at his home at Pleasanton, W. Va., July 1. He was born in Hollidaysburg, Pa., 57 years ago.

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JACOB ECKEL, superintendent and a director of the Eckel-Nye Steel Co., Syracuse, N. Y., died at his home in that city, July 7, aged 75 years. He was the son of Phillip Eckel, founder of the company.

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WILLIAM C. KIDD, sales representative of the Ramapo Ajax Corporation, Hillburn, N. Y., and secretary-treasurer of the Track Supply Association, died at his home in Suffern, N. Y., on July 5. He was born in England, April 23, 1858, and entered the employ of the Ramapo Iron Works, now the Ramapo Ajax Corporation, in 1881. He was instrumental in the development of the Ramapo automatic switchstand, and during his association of nearly 30 years with the Ramapo sales organization, he became one of the most widely known men in the track supply field.

JAY B. ODELL, vice-president in charge of purchasing and traffic for the Western Electric Co., New York, died July 8 at the New Rochelle Hospital, following an operation for appendicitis. Mr. Odell, who was 44 years of age, was born at Iowa Falls, Iowa, and was graduated from Cornell University in 1904. He immediately entered the employ of the Western Electric Co. at New York, later going to the Hawthorne works, Chicago. In 1918 he became manager of the company's Richmond, Va., distributing plant, returning to New York in 1921 to take charge of the distributing plant there. He was made assistant to the president in 1924 and a vice-president in 1926.

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ERNEST B. ALLEN, district sales representative at Louisville, Ky., for the Bethlehem Steel Co., died on July 5. He became associated with the sales department of the Midvale Steel & Ordnance Co. in 1919 and when that company was absorbed by the Bethlehem company he continued in the same capacity. He was 47 years of age.

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CHARLES A. MORSS, vice-president Simplex Wire & Cable Co., and a director of the Simplex Electric Heating Co., Boston, died on July 5. He was born in Boston, July 13, 1857, and began his career in the wool business. Subsequently he was associated with his father in Morss, Whyte & Co. The Simplex Wire & Cable Co. was an outgrowth of that firm and Mr. Morss was made treasurer, a position he held until he was made governor of the Federal Reserve Bank of Boston.

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GEORGE T. GOULD, of Stone & Webster, Inc., Boston, and a son of Harry E. D. Gould, general manager Fore River Works, Bethlehem Shipbuilding Corporation, Ltd., was drowned July 4, at Orleans, Mass. He received his engineering training at Cornell University and Massachusetts Institute of Technology. He was 25 years of age.

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ALBERT RICHARD PRITCHARD, president Pritchard Stamping Co., Rochester, N. Y., died July 8, at the Breakers Hotel, Lynn, Mass. He was born 64 years ago at Rochester and attended Phillips Academy, Exeter, Mass., before going to Yale. He became president of the stamping company shortly after leaving college.

Railroad locomotives shipped from the principal manufacturing plants in June are reported by the Department of Commerce at 89, of which eight were on foreign account. This compares with 109 in May, including 17 for export, and with 159 for June of last year, of which 15 were for export. Unfilled orders at the end of June totaled 393. There was a considerable drop in unfilled orders on domestic account, but an increase from 20 to 36 for foreign markets.

Tutein vs. Hudson Valley Case Reaches Arbitration Stage

The controversy between E. Arthur Tutein, Inc., Boston, and the Hudson Valley Coke & Products Corporation, Troy, N. Y., has reached the arbitration stage as the result of recent developments in a case that got into the Supreme Court of New York following the cancellation of a sales contract by the latter company. Leo Oppenheimer, New York, counsel for the Tutein company, will act as arbitrator for his client, and United States Senator Robert F. Wagner has been appointed as arbitrator for the Hudson Valley company. If these two fail to agree on a third arbitrator, the president of the American Iron and Steel Institute will make the selection.

The arbitration board itself will determine the scope of the arbitration. Among points that it will decide will be whether the Hudson Valley company had the right to cancel its contract with the Tutein company; what damages, if any, are due the Tutein company; whether the Tutein company committed a breach of contract and, if so, the extent of the damages due to the Hudson Valley company.

The arbitration board will concern itself only with a 10-year contract with two five-year renewal clauses which gave the Tutein company the exclusive sales agency for the pig iron and coke produced by the Hudson Valley corporation. The cancellation of a similar contract with the Tutein company for the sale of by-products has not yet resulted in legal action.

A permanent restraining order drawn up by Justice Phoenix Ingraham, which replaces a temporary injunction granted to the Tutein company at the inception of the case, provides that collections of Hudson Valley accounts by the Tutein company shall be held in escrow pending a settlement. The Tutein company is permitted, however, to draw against these moneys for all unpaid commissions as they fall due. The order also stipulates that pig iron and coke accounts, under the contract, that are still due are to be paid direct to the Hudson Valley company.

British Iron and Steel Output Declined in June

LONDON, ENGLAND, July 12 (*By Cable*).—Production of pig iron in June was 650,500 gross tons and that of steel ingots was 747,300 tons. This compares with 720,100 tons of pig iron and with 882,500 tons of steel in May, the June output being a decline in both.

The comparison of the January, February, March and April production with the monthly output in recent years is shown by the following table in gross tons:

	Pig Iron, Tons	Steel Ingots and Castings, Tons
1913—Average monthly...	855,000	638,600
1920—Average monthly...	669,500	755,600
1922—Average monthly...	408,500	490,100
1923—Average monthly...	620,000	706,800
1924—Average monthly...	609,900	685,100
1925—Average monthly...	519,700	616,400
1926—Average monthly...	203,500	296,700
1927—First quarter, per mo.	559,100	835,700
1927—April	680,000	850,100
1927—May	720,100	882,500
1927—June	650,500	747,300

An international foundry exposition, coupled with an international congress, will be held in Paris in September. The general syndicate of French Foundrymen, 8 Rue de la Victoire, Paris, is in charge of all arrangements. American founders and manufacturers of foundry supplies are urged to send exhibits. The French organization has taken steps to obtain special ocean freight rates from the French Line and reduced railroad rates in France to the exposition grounds. The grounds are considered by the French Government as a bonded warehouse, thus obviating need for payment of customs duties.

The National Cast Iron Pipe Co., Birmingham, has opened an eastern and export sales office at 255 Broadway, New York, in charge of O. A. Nelson, formerly in the Kansas City, Mo., office of the company.

Producers of Manganese Ores to Meet at Washington

A meeting of domestic producers of manganese ores is appointed for Tuesday, Aug. 2, at the New Willard Hotel, Washington. The call states that the purpose is to organize and consolidate efforts in behalf of American manganese and that "questions of importance to the United States, so far as manganese is concerned and questions of importance to manganese ore producers will be discussed." Persons directly interested in American manganese ores are invited to attend. The call is signed by J. Carson Adkerson, Woodstock, Va.; N. H. Mannakee, Bluefield, W. Va.; H. A. Pumpelly, Owego, N. Y.; J. H. Cole, Philipsburg, Mont., and William D. Meyering, City Hall, Chicago.

Pacific Coast Founders Affiliate with National Association

The Pacific Coast Founders Association has become affiliated with the National Founders Association, thus extending the national organization to include practically every part of the United States. D. B. Hinckley is commissioner of the Pacific Coast group.

Special Brands of Stainless Steel Described

An attractive booklet of 52 pages has been issued by the Carpenter Steel Co., Reading, Pa., entitled "Carpenter Stainless Steels." The first 19 pages of the booklet discuss the general characteristics of chromium in iron and steel, including the effects of carbon, of chromium and of scale as factors affecting corrosion tests. There then follow three sections devoted to a discussion of three types of stainless steel made by the company, namely: Carpenter stainless steel, Nos. 1, 2, and 3. The booklet is well illustrated and the physical and chemical properties of the various steels are discussed in detail.

Operations in Mahoning Valley

YOUNGSTOWN, July 12.—Merchant steel bar output has declined to 40 per cent with the independents. The Youngstown Sheet & Tube Co. has reduced production in the Youngstown district to a 60 per cent average. It has started A stack in its Campbell blast furnace group, but has dropped another furnace in this complement, leaving three in action. The Republic Iron & Steel Co. has started 16 sheet mills at its DeForest works, Niles, idle one week. Its Bessemer department has been reduced to a schedule of one turn per day. All Valley companies are taking advantage of the temporary lull in business to improve equipment and place their properties in better condition.

Penn Seaboard Receivers Appointed

Receivers for the Penn Seaboard Steel Corporation have been appointed by the United States District Court at Wilmington, Del. They are Alexander F. Crichton, Wilmington, and William P. Barba, Philadelphia. They are given power to apply for ancillary receivers in either jurisdictions if necessary.

The Electric Storage Battery Co. has recently provided new and larger plants in Detroit and San Francisco. The Detroit branch, H. G. Carron manager, has moved its quarters from 5740 Cass Avenue to 8051 West Chicago Boulevard. The San Francisco branch is located at 6150 Third Street. The manager is G. R. Murphy. Both plants are manufacturing units, with floor space of 35,000 sq. ft. Stocks of Exide batteries for automobile, radio, industrial and commercial purposes will be kept in these two branches. The Electric Storage Battery Co. has also opened a new factory branch at 1955 Hunting Park Avenue, Philadelphia, in charge of W. C. Hooven.

British Exporting More Pig Iron

Continental Markets Still Dull—Poland Pays Export Rebates—European Alloy Steel and Zinc Producers Merge

(*By Cable*)

LONDON, ENGLAND, July 11.

THERE is a slight improvement in demand for Cleveland pig iron and sales are increasing, but many consumers are still expecting further reductions while makers are holding firmly to present prices. Hematite is more active, especially for export to France and Italy.

In Scotland there are 35 blast furnaces in operation and on the West Coast 14 in blast. Foreign ore continues quiet with British users, but Belgian consumers are showing more interest in Scandinavian ores.

Finished steel has been quiet in view of the approach of the holidays. Glasgow works will close this week for the Fair holidays. Plate makers are still in need of orders, but structural and light material mills are moderately active. The Wear shipyard of William Gray & Co., Pallion, Sunderland, has secured orders for six new vessels.

Tin plate is dull and prices are weakening with makers anxious for orders. Sales of small quantities have been effected at 18s. 7½d. ($4.50) per base box f.o.b. works port, which is claimed to be below cost where Welsh sheet bars are used. Output has been further curtailed to about 50 per cent of capacity, the absence of orders and depressed prices causing grave concern to many makers.

Galvanized sheets are quiet and prices weak with works in need of orders. Black sheet prices are easier as a result of the poor general demand.

Continental iron and steel is quiet, but prices are being maintained as makers are not seriously in need of tonnage. There is some demand but sales are restricted to small lots.

FRENCH PRICES LOW

Consumers Beginning to Replenish Stocks—Keen Competition in British Pig Iron

PARIS, FRANCE, July 1.—Business is still depressed and mills consider themselves fortunate to have been able to maintain domestic and export prices without making drastic reductions. Competition is keen, however, and concessions are usually necessary to secure desirable business. There is a growing belief among mills that the only solution to the present problem is reduction of output rather than continued selling at the present unprofitable price level.

In some quarters there is the suggestion that prices have reached their lowest level and that by the end of the summer there may be some improvement, with buyers forced to replenish stocks. A few rolling mills are already booked with such business and have sufficient tonnage for the next four to five weeks. This tendency of consumers to take advantage of the present low market seems to be more pronounced in Belgium than in France.

Pig Iron.—Although the domestic market on phosphoric foundry iron is unchanged some reduction is expected to develop in a few days. In the export field, competition is becoming more active, particularly on the part of British furnaces. The recent irregularity of the market, however, has disappeared and export sellers are quoting the established price of the pig iron entente, following the temporary confusion caused by the sale of a sizable stock of iron by a Luxemburg sales organization. The competition of Cleveland iron, which has been reduced by the British furnaces to £3 10s. ($16.97) per ton, f.o.b. works, is not yet serious. The hematite market, however, is feeling the competition of the British product. As an example, a recent British offer consisted of about 500 tons of hematite, 2.00 to 2.50 per cent Si, 0.85 per cent Mn, 0.08 per cent P, and 0.06 per cent S, quoted at £4 1s. ($19.64) per ton, c.i.f. Rouen, Mantes or Bordeaux. The agreement of domestic producers of hematite has been renewed from July 1, effective three months, with De Wendel et Cie., still refusing to join.

Semi-Finished Material.—The domestic market is quiet and foreign purchasers are still withholding

British and Continental European prices per gross ton, except where otherwise stated, f. o. b. makers' works, with American equivalent figured at $4.85 per £ as follows:

Durham coke, del'd.	£0	19s.	to £1	0s.	$4.60	to	$4.85
Bilbao Rubio ore†	1	1¾	to 1	2	5.27	to	5.33
Cleveland No. 1 fdy.	3	12½			17.57*		
Cleveland No. 3 fdy.	3	10			16.97*		
Cleveland No. 4 fdy.	3	9			16.73*		
Cleveland No. 4 forge	3	8½			16.61*		
Cleveland basic	3	15	to 3	15½	18.18	to	18.30
East Coast mixed	3	17			18.66		
East Coast hematite	3	17½			18.79		
Rails, 60 lb. and up.	7	15	to 8	5	37.58	to	40.01
Billets	7	5	to 7	10	35.16	to	36.37
Ferromanganese	12	0			58.20		
Ferromanganese (export)	11	15			56.98		
Sheet and tin plate bars, Welsh	6	5			30.31		
Tin plate, base box	0	18½	to 0	18¾	4.48	to	4.54
Black sheets, Japanese specifications.	13	15			66.68		
					C. per Lb.		
Ship plates	7	12½	to 8	0	1.65	to	1.73
Boiler plates	10	10	to 11	0	2.27	to	2.38
Tees	8	2½	to 8	12½	1.75	to	1.87
Channels	7	7½	to 7	17½	1.60	to	1.70
Beams	7	2½	to 7	12½	1.54	to	1.65
Round bars, ¾ to 3 in.	8	0	to 8	10	1.73	to	1.84
Steel hoops	10	10	to 11	0	2.28	to	2.39
Black sheets, 24 gage	10	10			2.28		
Galv. sheets, 24 gage	14	0			3.03		
Cold rolled steel strip, 20 gage, nom.	14	0			3.03		

*Export price, 6d. (12c.) per ton higher.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£3	1s.	to £3	2s.	$14.79	to	$15.03
France	3	1	to 3	2	14.79	to	15.03
Luxemburg	3	1	to 3	2	14.79	to	15.03
Basic pig iron:							
Belgium	3	0	to 3	1	14.55	to	14.79
France	3	0	to 3	1	14.55	to	14.79
Luxemburg	3	0	to 3	1	14.55	to	14.79
Coke	0	18			4.37		
Billets:							
Belgium	4	6	to 4	8	20.85	to	21.33
France	4	6	to 4	8	20.85	to	21.33
Merchant bars:					C. per Lb.		
Belgium	4	13			1.02		
France	4	13			1.02		
Luxemburg	4	13			1.02		
Joists (beams):							
Belgium	4	14			1.03		
France	4	14			1.03		
Luxemburg	4	14			1.03		
Angles:							
Belgium	4	15			1.04		
⅛-in. plates:							
Belgium (nominal)	6	5			1.37		
Germany (nominal)	6	5			1.37		
⅜-in. ship plates:							
Belgium	6	0			1.32		
Luxemburg	6	0			1.32		
Sheets, heavy:							
Belgium	6	1			1.33		
Germany	6	1			1.33		

(a) Nominal.

orders despite the concessions being offered. Blooms are particularly quiet and range in price from £4 to £4 4s. ($19.40 to $20.37) per metric ton. Billets are also inactive with buyers in many instances insisting upon £4 4s. ($20.37) per metric ton, although the current market is quoted at £4 5s. to £4 7s. 6d. ($20.61 to $21.22) per metric ton. Sheet bars are quoted at £4 8s. 6d. to £4 9s. ($21.45 to $21.57) per metric ton, f.o.b. Antwerp.

Finished Material.—Beams are in small demand and concessions are being offered to secure tonnage. For export quotations are nominally from £4 12s. to £4 14s. 6d. (1.01c. to 1.03c. per lb.) per metric ton, f.o.b. Antwerp. The domestic price on rails has been reduced 45 fr. per metric ton to 795 fr., but the export price continues unchanged at £6 5s. ($30.31) per ton, f.o.b. Antwerp. Bars range from £4 13s. to £4 13s. 6d. per metric ton (1.02c. to 1.025c. per lb.).

Production.—On June 1, of 218 furnaces in France, 146 were in blast. The total output of pig iron was 794,175 metric tons. The ingot output was 913,513 metric tons, of which 503,055 tons was basic Bessemer and 193,767 tons open-hearth.

POLAND PAYS REBATES

Refund of "Duties" on Exports Which Are Declared Unprofitable

WARSAW, POLAND, June 27.—The Government decided on June 22 to pay premiums to the steel industry for export. The official report states that this is a refund of duties, but as there is no export duty in Poland, it is not quite clear as to what duty is being refunded. The payments consist of 2.50 zlotys per 100 kg. (0.14c. per lb.) on bars and beams, 3.50 zlotys per 100 kg. (0.19c. per lb.) on plates, 4 zlotys (0.22c. per lb.) on sheets, up to about 10 zlotys (0.54c. per lb.) on machinery.

Following a period of expansion and increased sales, a reaction seems to have set in in the iron and steel market. The price increases announced in the spring by the Polish Steel Syndicate were strongly opposed by domestic consumers and resulted in a threat by the Ministry of Trade and Industry to enter into drastic control of the syndicate. As a result, the syndicate altered its position and promised to give special rebates to consumers producing finished materials for export. This has apparently been of little aid to business. The domestic market has been depressed and export business has been forced to the maximum, being carried on at present at a loss, according to the syndicate. Sales of steel by the syndicate show a steady decline from 54,100 tons in March to 40,000 tons in April and to 33,000 tons in May.

Pig iron production in the first quarter of 1927 was 133,000 tons compared with 82,000 tons in the first quarter of 1926. Steel ingot output in the first quarter was 307,000 tons compared with only 158,000 tons in the same quarter of last year.

German Ore Purchases for Long Terms

HAMBURG, GERMANY, June 27.—Some of the large contracts for ore recently made by German consumers are said to extend over periods up to 15 years. Among the most important contracts for ore are those made with the Grangesberg Co. in Sweden. There have also been heavy tonnages of North African, Spanish and Austrian iron ore purchased. Ore prices show an upward tendency as compared with the quotations ruling in May, with the exception of Caucasian manganese ore.

Current prices of various ores, c.i.f. Emden, Hamburg or Rotterdam, are as follows: Swedish low phosphorus ore, 50 per cent iron, $5.50 per ton; North African iron ore, 50 per cent iron, $4.25 per ton with 60 per cent iron at $5.25 per ton; Spanish Bilbao Rubio, $5.05 per ton; French iron ore, 45 per cent iron, $3.70 per ton. The market on minette ores is soft and $1.40 per ton, f.o.b. frontier, is paid for 32 per cent iron content. Austrian iron ore is being exchanged for coke on an equal basis. Indian manganese ore is quoted at 37c. per unit for 48 per cent manganese content.

LUXEMBURG MARKET QUIET

Concessions Offered—Small Export Trade With Sweden and Brazil

LUXEMBURG, June 25.—The improvement in business that began in May has not been very well maintained during June, and prices have shown a tendency to softness. Competition from French, Belgian and German mills is keen, but most Luxemburg mills are fairly well booked with tonnage and some sizable orders have been taken for export to Brazil and Sweden with some desirable business expected from Norway.

Recently there have been complaints at the slowness of negotiations for giving greater control to the French-Belgian-Luxemburg pig-iron entente. It is pointed out that prices as a result of this delay are irregular, with furnaces quoting whatever is considered necessary to meet British competition. Although the established prices range from £3 5s. to £3 7s. 6d. ($15.76 to $16.37) per metric ton for export, sales have been made at £3 2s. to £3 5s. ($15.03 to $15.76) per ton.

Beam prices are fairly steady on sales to German consumers, as a sizable tonnage is being exported to Germany, but on export sales to other countries concessions have been made and the market is nominal. The sheet market is quiet and deliveries are short. The Acieries Reunies de Burbach-Eich-Dudelange has completed its new installation for the production of thin gage sheets and the results are reported satisfactory. The Société des Hauts Fourneaux et Acieries de Differdange will shortly resume operation of its Rumelange plant, which has been closed since 1919.

At the end of May, 41 of the 47 blast furnaces in the country were operating. The May production of pig iron was 237,614 metric tons.

Sheets Strong and Tin Plate Quiet in Japan

KOBE, JAPAN, June 7.—The black sheet market has been very steady, according to the metal market report of A. Cameron & Co., Ltd., Kobe. The report says in part: This was chiefly due to the scarcity of stocks of both Japanese and foreign brands. One of the chief brands of Japanese make is manufactured by the Tokuyama Sheet Mills, which have been completely sold out and therefore are not in position to offer any prompt shipment stock. Arrivals from both the United States and the United Kingdom during the month of May were very small and these were purchased at considerably higher than present market prices, so importers were in no hurry to dispose of their holdings. There is the possibility of the Kawasaki Dockyard Co.'s having to curtail or cease entirely its manufacture of black sheets, and this has created a bullish sentiment in the market. Ruling prices at the end of May were 75 sen per sheet for American "Eagle" brand, 3 x 6 ft., 13 sheets to the bundle and 74 sen per sheet for British "Raven" and "Globe" brands.

In the tin plate market the Government works has announced a further reduction in prices for tin plate, quotations being 21.20 yen ($10.28) per box of 170 lb. and 11.00 yen ($5.19) per box of 100 lb. In the absence of any large buying, this has created considerable pessimism and prices have sagged during the past month. Since the moratorium the yen has declined approximately 5 per cent and this should have stimulated the yen prices for tin plate. Efforts of merchants to bolster the market by restriction of sales have met with failure. American coke tin plate was selling at the end of May at 22.10 yen ($10.43) per box of 170 lb. and 12.20 yen per box of 100 lb. British primes were quoted at 22.00 yen ($10.39) per box of 170 lb. and 12.00 yen ($5.67) per box of 100 lb.

Replacement of all World War and other old types of airplanes will be completely made by Sept 1 for the army and National Guard, according to an announcement by Assistant Secretary of War for Air F. Trubee Davison. Progress points to the increased use of all-metal planes, and many replacements are of that type.

German and Polish Zinc Producers to Merge

HAMBURG, GERMANY, June 27.—A merger of Polish and German zinc producers is reported imminent. A German group including the Mansfeld A. G. with about 30,000 tons annual production, the Aktiengesellschaft für Berg und Hüttenbaubetrieb and the Hohenlohe Hütte in Silesia with combined output of about 18,000 tons a year has formed a syndicate with the Polish Giesche Spolka Co., the production of which is about 52,000 tons a year. The total output of this group is about 90,000 tons a year. The only other large German group, Aron Hirsch & Sohn Co. and the Donnersmarkhütte with combined capacity of 20,000 tons a year, are about to join, so that the total output of the syndicate will be about 110,000 tons a year, which represents a large part of the German-Polish production.

Alloy Steel Makers in Three Countries May Merge

HAMBURG, GERMANY, June 27.—A merger of alloy steel manufacturers in three countries is in prospect. Schoeller & Bleckmann, who control the Austrian output of alloy steels, recently formed an association with the large Czechoslovakian producer, the Poldi Steel Works. It is reported now that the largest German alloy steel manufacturer not in the corporation, the Stahlwerke Roechling Buderus at Wetzlar, Lahn, is negotiating with the association and a merger is in prospect. The combined output of the merged companies in Germany, Austria and Czechoslovakia would be equivalent to the capacity of the German corporation, which includes most of the alloy steel makers of Germany.

French Exports to the United States Small

PARIS, FRANCE, July 1.—Of the exports in May only a small percentage went to consumers in the United States. The total exports of semi-finished and finished steel were 226,782 metric tons, of which 1263 tons went to the United States. Of the 1,259,233 metric tons exported in the five months from January to May, inclusive, 11,787 tons went to the United States. In May exports of rails totaled 31,752 metric tons, of which 170 tons were shipped to the United States. The largest shipments of rails were to Germany, which took 2962 metric tons, Switzerland being second with 2887 tons, Japan third with 2507 tons and Great Britain fourth with 2423 tons. The total export of rails in the five months from January to May was 155,996 tons.

British Mills Sell Tubes in Germany

HAMBURG, GERMANY, June 28.—For the first time since 1914, British mills have contracted for large tonnages of tubes with German consumers at prices below the usual British export quotations. This is regarded in some quarters as evidence that the British mills are willing to join the Continental tube association and are using this means to establish themselves in a stronger export position. It is further pointed out that it was recently reported that the head of the German Steel Syndicate and a representative of the United Steel Works are in London to confer with the British mills.

A survey of the New Orleans industrial zone has been issued by the Industrial Bureau of the New Orleans Association of Commerce. Calling the zone the nation's second port, a great array of figures and facts is brought to the attention of those interested, while a profusion of illustrations, both from photographs and line cuts, tell the story of the growing trade of the lower Mississippi Valley.

VIRGINIA RATES REDUCED

Pig Iron Rates to Eastern Seaboard States Cut 53c. to 71c. Per Ton

WASHINGTON, July 12.—Rates on pig iron from Virginia furnaces to destinations in Maryland, Pennsylvania, Delaware, New Jersey, New York and New England were ordered reduced by the Interstate Commerce Commission in a decision made public last Saturday, the new schedules to become effective on or before Aug. 29. The decreases to important consuming points range from 53c. to 71c. per gross ton.

The following table indicates the new and old rates per ton, together with the amount of the reductions. All Virginia furnaces take the same rates.

To	New Rate	Present Rate	Reduction
Baltimore	$3.88	$4.41	53c.
Philadelphia	4.54	5.17	63c.
New York.....	4.87	5.54	67c.
Boston	5.21	5.92	71c.

Respective rates from Pennsylvania producing points to the same respective destinations are indicated by the following: From Birdsboro, $2.27, $1.13, $2.65, $3.65; from Reading, $2.27, $1.13, $2.65, $3.65; from Steelton, $1.64, $1.64, $3.02, $3.65; from Swedeland, $2.27, 76c., $2.52, $3.65; from Pittsburgh $4.66, $4.91, $5.42, $5.92. The latter rate applying to Boston is the present rate from the Virginia furnaces, which now will have a differential of 71c. under Pittsburgh. Shipments of iron from the Pittsburgh district to New England territory, however, are small. The report of the commission reversed the proposal of the examiner in the case, who had held that the Virginia rates were not unreasonable and had recommended dismissal of the complaint.

The commission pointed out that the bulk of the iron coming from the Virginia furnaces is foundry grade "which is considered a better quality of iron than that ordinarily produced in Pennsylvania and commands a higher price" and that the Virginia furnaces formerly shipped large proportions of their product to the destinations involved. Many of the Virginia furnaces, the report said, are not now in operation. It added that "the same is true of many of the Pennsylvania furnaces."

Virginia producers stated that originally furnaces in the Pittsburgh district and at Buffalo and Youngstown constituted their chief competitors but that subsequently conditions had so changed that they encountered their principal competition from stacks east of Harrisburg, Pa. The commission explained, however, that it had repeatedly stated that it cannot readjust rates "merely in order to equalize market conditions."

File Exceptions to Report on Ohio Pig Iron Rates

WASHINGTON, July 12.—Exceptions have been filed with the Interstate Commerce Commission to a proposed report of Examiner W. M. Carney, which held that prevailing intrastate rates in Ohio on pig iron are justified. The Pennsylvania Railroad declared in a brief that the commission should find that the rates required by the Public Utilities Commission of Ohio will cause undue advantage to intrastate commerce on the one hand and unjust discrimination against interstate commerce on the other. The West Virginia Malleable Iron Corporation said that the examiner should have found that the rate on pig iron from Ironton to Point Pleasant should not exceed $1.87 a ton. The existing rate is $2.27.

"Iron Ore (Hematite) Mining Practice in the Birmingham District, Alabama" is the title of Bulletin 239 of the United States Bureau of Mines. The author is W. R. Crane. The pamphlet contains 139 pages, fully illustrated, and gives complete information concerning the character of the ore and the mining methods used.

Machinery Markets and News of the Works

FURTHER RECESSION

Machine Tool Buying Shows Falling Off This Month

Dodge Brothers, Inc., Buys 25 Special Automatic Tools for Machining Cylinder Blocks

A FURTHER recession in machine tool buying has developed this month. Machine tool builders are holding production in check to conform to the reduced volume of incoming business. Except for one or two special orders, the week's business has been in single machines.

Dodge Brothers, Inc., Detroit, has bought 25 special automatic tools for machining cylinder blocks for automobiles, this being one of the largest orders to come from the motor industry this year. Another order of fair size involves about 15 new tools and accessories for a machine shop for the College of Physicians and Surgeons, New York.

There has been a small amount of railroad buying, including several punches and shears ordered by the Pennsylvania. The Rock Island and Santa Fe are asking for prices on a few machines. The latter road has recently bought nine lathes, but probably will order several more.

The National Machine Tool Builders' Association, in its monthly review of business conditions in its field, states that machine tool orders were larger in June than in May, but observes that the"lack of snap" in the present demand is due to the fact that "the country is not pressed for equipment to get out its present production." The association sees no signs of any immediate change in this situation in either direction. Machine tool builders look for the bulk of the business in the near future to come from companies which have large capital and have an opportunity to use more productive tools in mass production.

New York

NEW YORK, July 12.

THE largest machine tool transaction of the week was the awarding of a contract to Manning, Maxwell & Moore, Inc., for equipping a machine shop for the College of Physicians and Surgeons, New York. The contract, which was awarded by Marc Eidlitz & Son, Inc., building contractor, involves about 15 new tools and accessories, together with the moving and setting up of machines now in the college's old shop. Inquiries and orders for machine tools so far this month are light. Railroad buying has almost ceased. Among the week's orders were a 48-in., 300-ton wheel press for the Nashville Railway & Light Co., Nashville, Tenn.; a 16 x 60-in. lathe for the Naval Research Laboratory at Bellevue, D. C., and a 16 x 60-in. lathe for the Connecticut State Trade School at Bridgeport, Conn. The Bearings Co. of America, Lancaster, Pa., will shortly be in the market for tools for the manufacture of bearings, its plant capacity to be increased about 50 per cent.

Bids have been asked on a general contract by the Bates-Chevrolet Corporation, Mott Avenue and 143d Street, New York, representative for the Chevrolet automobile, for a three-story service and repair building to cost about $100,000 with equipment. George A. Bagge & Son, 156 East Forty-fourth Street, are achitects.

M. E. Bernhardt, Inc., New York, has been formed with an authorized capital of $1,000,000 to take over and expand the business heretofore operated by M. E. Bernhardt, 127 West Thirtieth Street, manufacturer of pocket cigar lighters and other friction and mechanical devices. The new company will be controlled and operated by the David A. Schulte interests, 386 Broadway.

Ovens, power equipment, conveying and other machinery will be installed in the new two-story plant to be erected in Brooklyn, by Cushman's Sons, Inc., 1819 Broadway, New York, baker, for which bids on a general contract are being asked until July 27. George Dress, 161 East 121st Street, New York, is architect.

Moore & Landsiedel, Third Avenue and 148th Street, New York, architects, have filed plans for a two-story automobile service, repair and garage building, 152 x 164 ft. to cost $135,000.

The Bellanca Aircraft Corporation of America, Inc., care of Andrew Bellanca, 165 Broadway, New York, recently organized with a capital of $1,000,000, is said to be arranging for the construction of a new airplane hangar and shop at Yonkers, N. Y.

Fuller & Robinson, 95 State Street, Albany, N. Y., architects, have plans for a new two-story automobile service, repair and garage building, to cost about $200,000 with equipment.

The United Electric Light & Power Co., 130 East Fifteenth Street, New York, has authorized enlargements in its Hell Gate electric generating plant at 132nd Street and the East River, comprising a new turbo-generator of 225,000 hp. capacity and accessory equipment, to cost upward of $1,000,000.

School District No. 4, Chappaqua, N. Y., is considering the installation of manual training equipment in a proposed new high and grade school to cost more than $300,000. J. Ambrose Thompson, 101 Park Avenue, New York, is architect.

The Defiance Button Machine Co., Inc., 43 West Twenty-fourth Street, New York, has plans for improvements and extensions in its factory at Long Island City. Charles M. Straub, 147 Fourth Avenue, New York, is architect.

The Newark Gear Cutting Machine Co., 65 Prospect Street, Newark, N. J., has begun the erection of a two-story addition, 48 x 95 ft., for which a general contract recently was let to Enstice Brothers, 111 Academy Street. Bishop & Scudder, 9 Clinton Street, are architects and engineers.

The Board of Education, West Orange, N. J., is said to be planning the installation of manual training equipment in a proposed new junior high school to cost upward of $350,000, for which preliminary plans are being drawn by Guilbert & Betelle, 24 Branford Place, Newark, architects.

The Asher Mfg. Co., 212 Colt Street, Irvington, N. J., manufacturer of laundry machinery and parts, has plans for a one-story addition to cost about $35,000 with equipment. R. W. Erler, 31 Fulton Street, Newark, is architect.

The Public Service Electric & Gas Co., Public Service Terminal, Newark, and 84 Sip Avenue, Jersey City, N. J., is having plans prepared for a new two-story equipment storage and distributing plant, 120 x 185 ft., at Jersey City, with service and garage building for motor trucks, to cost about $150,000. The company has also filed plans for extensions and improvements in its two-story power house at Elizabeth, N. J., to cost about $70,000.

The Western Electric Co., 195 Broadway, New York, manufacturer of telephone equipment, etc., is asking bids on a general contract until July 18 for a new six-story unit at Kearny, N. J., to be known as Building No. 30 E,

60 x 420 ft., to cost more than $500,000. O. G. Spurling is company engineer.

The Borough Council, Tenafly, N. J., is asking bids until July 18 for a sewage pumping station, with two electrically-operated pumping units and one gasoline-operated centrifugal pump. Fuller & McClintock, 170 Broadway, New York, are engineers.

The Wallace & Tiernan Co., Inc., 1 Mill Street, Belleville, N. J., manufacturer of chlorine control equipment, including vacuum apparatus, scales, etc., has awarded a general contract to J. Sutherland, 133 South Fifteenth Street, Newark, for a four-story addition to cost approximately $150,000.

The Eclipse Machine Co. has removed its Hoboken, N. J., plant to 545 North Arlington Avenue, East Orange, N. J.

The National Chromium Corporation, 200 Varick Street, New York, has been organized to do chromium plating. A plant is under construction and equipment has been purchased.

The New York office of the American Zinc Products Co., Greencastle, Ind., has been removed from 50 Church Street to 347 Madison Avenue.

New England

BOSTON, July 11.

THE New England machine tool market is less active than at any previous time this year. Machine shops and metal-working plants are operating on a hand-to-mouth basis and the number of idle mechanics is increasing weekly. Shops that contemplated the purchase of one or more tools have postponed buying because business for which the equipment was required has not developed. New inquiries are few. Comparatively little used equipment is being liquidated, consequently the inactivity of dealers cannot be attributed to an influx of such tools. New England machine tool manufacturers in some instances are calling on prospects in other sections of the country, but securing little new business. The backlog of the industry, as a whole, is reported as smaller than it has been in months.

Work will start immediately at Canaan, Vt., on a power house, pipe line, etc., for the New England Public Service Co., 131 State Street, Boston. Plans are by the owner.

The plant of the Quincy Scales Co., 56 Penn Street, South Quincy, Mass., has been sold to the Prudential Building Service Corporation, Quincy. The main building is equipped with an electric crane, and there is an electric hoist in the yard.

A permit has been granted the Quality Lens Co., 39 Hartwell Street, Southbridge, Mass., to build a two-story, 16 x 72 ft. addition. Plans are private.

Roy A. Means, Quincy, Mass., will erect a one-story, 38 x 63 ft., machine shop at 115 Arborway Drive. Plans are private.

The city of Everett, Mass., has plans for a one-story addition to its junior high school on Summer Street to contain mechanical shops, etc. T. E. Murphy, 391 Broadway; A. L. Parsons, 50 Vernal Street; T. F. Hughes, 126 Garland Street; Joseph Lovegreen, 37 High Street, and David Huey, 46 Marie Avenue, constitute the building commission. The Frank Irving Cooper Corporation, 172 Tremont Street, Boston, designed the plans.

The city of Boston closes bids July 14 on sheet metal-working machinery for the South Boston high school, and on wood-working machinery for the Joseph Barnes, East Boston, and Edmund P. Tileston, Dorchester schools.

Joseph Beal, Boston, and Theodore Friedberg, New York, have sold the Bath Iron Works, Bath, Me., to the New England Public Service Co., a holding company for the Maine Central Power Co. and other Insull interests. It is understood the new owners plan to interest manufacturers in operating various units of the former shipbuilding plant. One manufacturing company already has agreed to operate a part of the plant. The name is withheld.

The Acorn Bearing Co., New Britain, Conn., has been incorporated and will continue the manufacture of flat thrust, grooved type and special bearings. The company will not require added factory space, but will be in the market from time to time for machinery and equipment.

The Springfield Gas Light Co., Springfield, Mass., has work under way on extensions to its coal-gas plant, including new retort house and other structures, to double the present capacity. It will cost in excess of $550,000.

The Sullivan Machinery Co., Claremont, N. H., manufacturer of mining machinery, air compressors, etc., has plans for a new power house to cost approximately $30,000 with equipment. Headquarters are at 122 South Michigan Avenue, Chicago. Charles T. Main, Inc., 201 Devonshire Street, Boston, is architect and engineer.

The Aircraft Corporation of America, Inc., 109 West Fifty-seventh Street, New York, has awarded a general contract to W. R. Muirhead & Son, Bridgeport, Conn., for its new plant on the Laurel Beach Road, Milford, Conn., to be one-story, 150 x 350 ft., with hangars and other buildings, to cost approximately $100,000 with equipment. A tract of 125 acres has been purchased.

The White Motor Co., East Seventy-ninth Street, Cleveland, manufacturer of motor trucks, has rejected bids recently received for its proposed service and repair building at Hartford, Conn., one-story, 140 x 150 ft., to cost about $100,000, with equipment, and will have revised plans drawn at once.

Officials of the Associated Gas & Electric Co., 61 Broadway, New York, have formed the New England Gas & Electric Association to take over and consolidate the Cambridge Electric Light Co., and Cambridge Gas Light Co., Cambridge, Mass.; Worcester Gas Light Co., Worcester, Mass.; Cape & Vineyard Electric Co., Falmouth, Mass.; and the Portsmouth Power Co., Portsmouth, N. H. Plans are under consideration for expansion and betterments, including transmission line construction. H. C. Hopson is vice-president and treasurer of the Associated company.

The E. R. Buck Chair Co., Sterling, Mass., has acquired the factory of the Sterling Textile Co., Clinton, Mass., closed for more than a year, and will equip for a new plant. It will replace a works recently destroyed by fire.

The Institutions Department, City Hall, Boston, is said to be planning the construction of a new power plant at the House of Correction, Deer Island, to cost about $125,000 with equipment.

The Sterling Motor Truck Co. of New England, 1031 Commonwealth Street, Boston, has leased a building to be erected at 290 North Beacon Street, Brighton, for a new service and repair plant. The entire project is reported to cost close to $100,000.

The N. D. Cass Co., Athol, Mass., manufacturer of toys, chairs and kindred products, is preparing an expansion program to provide for considerable increase in capacity. The company is affiliated with the E. C. Bradley Co., Brattleboro, Vt., manufacturer of turned wood products, as well as with the Gardner Screw Co., Gardner, Mass.

Chicago

CHICAGO, July 11.

SALES of machine tools are not in large number, yet miscellaneous orders are bringing a fair amount of business to dealers. Fresh inquiry is sluggish but live prospects are in larger volume than at the turn of the month.

Pines Winterfront, Chicago, has purchased a 20-in. lathe, a 20-in. shaper and a No. 3 milling machine. The Allis-Chalmers Mfg. Co., Milwaukee, has ordered a 40-ft. boring and turning mill from the Niles Tool Works Co., Hamilton, Ohio, and the Nash Motors Co., Racine, Wis., has placed several items, including drilling equipment. The Rock Island Railroad is asking for prices on a triple-head bolt cutter and a 16-in. motor-driven portable lathe for delivery to Horton, Kansas. The Santa Fe is requesting additional information on a 60-in. open side planer and 42-in. and 48-in. double housing planers, these items still being open on the list issued last spring. The Mississippi Valley Structural Steel Co. has not as yet asked for prices on equipment for its new structural shop at Melrose Park, Ill.

The Central Illinois Public Service Co. is having plans prepared for a new power plant at Beardstown, Ill.

The Sanitary District Offices, Chicago, has had plans prepared for a 65,000-hp. power plant at Lockport, Ill., to cost $6,000,000.

George R. Anderson, 6830 Stony Island Avenue, Chicago, will build a two-story public garage to cost $70,000. Fox & Fox, 38 South Dearborn Street, are architects.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, will build a substation, 42 x 161 ft., to cost $63,000. Graham, Anderson, Probst & White, 228 North La Salle Street, are architects.

The Peoples Gas Light & Coke Co., 122 South Michigan Avenue, Chicago, will build a two-story compressor building, 60 x 65 ft., to cost $50,000.

The Charles F. Elmes Engineering Works, Chicago, has opened a New York export office which is under the direction of Paul H. Petersen, export agent for five machine tool lines.

The Gardner Governor Co., Quincy, Ill., manufacturer of compressors, pumps and governors, and the Denver Rock Drill Mfg. Co., Denver, Colo., maker of rock drills and kindred equipment, have been merged under the name of

The Crane Market

THERE is very little new inquiry for either electric overhead or locomotive cranes and in a few instances prospective purchasers are inclined to postpone buying temporarily. It is reported that the two 20-ton locomotive cranes for the New York Central Railroad may not be closed for some time. The Amtorg Trading Corporation has finally awarded the three 25-ton locomotive cranes for which it has been in the market for several weeks.

Among recent purchases are:

George M. Brewster, Hackensack, N. J., a 25-ton standard locomotive crane from the Browning Crane Co.

General Electric Co., Schenectady, N. Y., a 10-ton, gasoline driven crawl tread locomotive crane for Buffalo, N. Y., from the Brown Hoisting Machinery Co.

Amtorg Trading Corporation, 165 Broadway, New York, three 25-ton standard locomotive cranes for export to Russia from the Industrial Works.

Safety Cable Co., Bayonne, N. J., a 15-ton, 41-ft. span electric traveling crane from the Shaw Electric Crane Co.

International Paper Co., 100 East Forty-second Street, New York, a 15-ton electric traveling crane with two 7½-ton trolleys for Port Edward, N. Y., from the Northern Engineering Works.

Coal Products Mfg. Co., Joliet, Ill., a 20-ton locomotive crane from the Browning Crane Co.

Steve Chiarello & Brothers, Inc., New York, stevedores, a used 10-ton P. & H. overhead crane from E. P. Galer, Grand Central Terminal, New York.

National Tube Co., Pittsburgh, four 20-ton, 4-hook, pipe handling cranes from the Morgan Engineering Co.

Russell, Burdsall & Ward Bolt & Nut Co., Coraopolis, Pa., two 10-ton, 50-ft. span overhead cranes from the Milwaukee Electric Crane & Mfg. Corporation.

John H. McGowan Co., Ironton, Ohio, a 5-ton, 26-ft. span overhead crane from the Shaw Electric Crane Co.

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the Gardner-Denver Co. J. W. Gardner, president of the Gardner company, will be chairman of the new organization, and W. H. Leonard, founder of the Denver company, will be president. It is expected that the manufacture of the heavier products of both companies will be centered at Quincy.

The General Steel Products, Inc., 415 Plymouth Building, Minneapolis, Minn., has been organized to manufacture coil spring for use under coach seats. The company is at present manufacturing by contract with the Waldron Machine Co., Minneapolis, and is in the market for spring steel.

The Blackhawk Foundry & Machine Co., Davenport, Iowa, has purchased the plant of the Davenport Vinegar & Pickling Works, and will remodel a portion of the building for foundry use. The Blackhawk organization makes gray iron and aluminum castings and other products.

The Peerless Ice Machine Co., Thirty-fifth Street and Parnell Avenue, Chicago, will build a manufacturing plant, 125 x 200 ft., to cost $125,000. The Kreitzer Construction Co. is general contractor.

The Federal Machinery Sales Co., 17 South Jefferson Street, Chicago, has been appointed agent for the Minster Machine Co., Minster, Ohio, manufacturer of punch presses.

The Independent Die & Supply Co., 2635 La Salle Street, Chicago, has been organized to take over the ownership and business of the Independent Die Co., Inc. No plant enlargements are expected in the near future. The company makes cutting dies for the shoe, textile and paper trades.

The Whitney Metal Tool Co., ball bearing punches, has purchased the three-story structure, 60 x 120 ft., known as the Wait Talcott Building, adjoining its factory building No. 2. The company now has 218 ft. frontage on Race and Forbes Streets and has about doubled its factory space.

Contract has been let by the Elgin Machine Works, Elgin, Ill., manufacturer of wrist pins and other automotive specialties, to the Illinois Hydraulic Stone & Construction Co., Elgin, for a one-story and part basement addition, 60 x 200 ft., to cost $40,000. George E. Morris, Sherwin Building, is architect.

The Illinois Bell Telephone Co., 212 West Washington Street, Chicago, has asked bids on general contract for a six-story equipment storage and distributing plant with repair department, to cost close to $850,000 with equipment. Holabird & Roche, 104 South Michigan Avenue, are architects.

The Sanitary District of Chicago, 910 South Michigan Avenue, is said to be considering the construction of a power plant at its properties at Lockport, Ill., to cost approximately $5,000,000 with machinery.

The Board of Education, Denver, Colo., contemplates the installation of manual training equipment in its proposed Park Hill junior high school at East Twenty-sixth Avenue and Holly Street, to cost $400,000, for which bids will be asked at once on a general contract. George H. Williamson, Majestic Building, is architect.

The John Deere Tractor Co., Waterloo, Iowa, manufacturer of gas and gasoline engines, parts, etc., has awarded a general contract to the Jens Olesen & Sons Construction Co., 1522 Lafayette Street, for a one-story addition, 120 x 300 ft., to cost $75,000 with equipment. O. A. Eckerman, Moline, Ill., is architect. A. H. Head is vice-president and general manager.

The Board of Trustees, University of Iowa, Iowa City, has authorized plans for a new unit at the central power plant at the institution, to be used primarily for heating service, to cost $150,000 with equipment.

Bids are being asked on general contract by Albertson & Co., 3100 Floyd Avenue, Sioux City, Iowa, manufacturers of valve grinders and kindred mechanical equipment, for a new four-story and basement addition, 43 x 135 ft., to cost approximately $45,000. K. E. Westerlind, War Eagle Building, is architect.

The Iowa Electric Co., Cedar Rapids, Iowa, is said to be considering the installation of a new artificial gas plant at Atlantic, Iowa, to cost about $125,000 with machinery.

The Montgomery Elevator Co., foot of Twentieth Street, Moline, Ill., will take bids about the middle of the month for its proposed two-story addition, estimated to cost $60,000 with equipment. Cervin, Horn & Stube, Safety Building, Rock Island, Ill., are architects. The company specializes in the manufacture of passenger and freight elevators.

The Cooper Mfg. Co., 411 South First Avenue, Marshalltown, Iowa, manufacturer of automobile parts, has begun the erection of a one-story addition, 35 x 190 ft., to cost approximately $50,000 with equipment.

The Wolf Tongue Mining Co., Nederland, Colo., is reported to be planning the rebuilding of the mill at its tungsten properties, destroyed by fire July 4, with loss in excess of $500,000 including equipment.

Philadelphia

PHILADELPHIA, July 11.

THE Wilkinson Equipment Co., 1011 Chestnut Street, Philadelphia, manufacturer of filing cabinets, etc., has acquired property at Fifty-third Street and Whitby Avenue, totaling about one-half acre of land, and contemplates the early erection of a new plant at that location.

The Air Reduction Co., 342 Madison Avenue, New York, manufacturer of acetylene welding equipment, etc., has concluded negotiations for the purchase of the United Oxygen Mfg. Co., Stock Exchange Building, Philadelphia, with two local plants, manufacturer of industrial oxygen, acetylene, welding apparatus, etc., and will consolidate with its organization. It is understood that the factories will be continued in service. The acquisition also includes the rights of the United Gas Contracting Co., Broad and Arch Streets, in the manufacture and sale of the products of the United Oxygen Mfg. Co., for which it has heretofore been acting as selling agent.

The Department of Public Safety, Electrical Division, City Hall, Philadelphia, is asking bids until July 26 for electrical equipment for installation at its station at Forty-third Street and Kingsessing Avenue.

The Ballinger Co., Twelfth and Chestnut Streets, Philadelphia, architect and engineer, has work under way on a new automobile service, repair and garage building, 170 x 170 ft., to cost more than $150,000 with equipment.

Bids will be asked in August by the Otis Elevator Co., Eleventh Avenue and Twenty-sixth Street, New York, for its proposed factory branch and distributing plant at Philadelphia, to be 60 x 160 ft., to cost close to $175,000 with equipment. W. O. Moyer is company engineer.

In connection with its new produce terminal at Delaware and Oregon Avenues, Philadelphia, recently completed, the Pennsylvania Railroad, Broad Street Station, will proceed with the erection of another unit, about 110 x 800 ft., on adjoining site, with cold storage and refrigerating plant of 2,000,000 cu. ft. capacity. It will cost in excess of $1,500,000 with equipment.

Bids have been asked by the United States Gypsum Co., 205 West Monroe Street, Chicago, manufacturer of building materials, for a one-story factory branch and distributing plant, 60 x 200 ft., at Fifty-eighth Street and the Schuylkill River, Philadelphia.

The John Lang Paper Co., Twenty-fourth and Vine Streets, Philadelphia, is said to have negotiations under way for the purchase of a portion of the former shipyard site of the Pusey & Jones Corporation, at Gloucester, N. J., for the establishment of a branch plant.

The Camden Motors Co., 525 Market Street, Camden, N. J., T. M. Cornbrooks, head, is having plans drawn for a new two-story service, repair and garage building, to cost close to $80,000 with equipment. Edwards & Green, 548 Federal Street, are architects.

The plant and property of the J. L. Mott Iron Works and J. L. Mott Co., Hancock Avenue, Trenton, N. J., in receivership for a number of years, has been ordered sold by the Federal Court to satisfy foreclosure proceedings on a mortgage of $2,000,000, covering the entire plant. It is said that the sale will be held early in the fall. Charles H. Baker and Robert K. Bowman are receivers.

The Public Service Electric & Gas Co., Public Service Terminal, Newark, N. J., has filed plans for the construction of a one-story automobile service, repair and garage building at Camden, N. J., for company motor trucks and cars, to cost approximately $150,000 with equipment.

The Joint School Commission, Benton, Pa., has asked bids on a general contract for its new two-story vocational high school to cost approximately $75,000 and expects to begin work within a few weeks. W. Walter Witman, Keystone Building, Harrisburg, Pa., is architect.

The Witt Steel Co., South Greensburg, Pa., has arranged for an increase in capital from $300,000 to $600,000, a portion of the proceeds to be used for expansion. The company has also filed notice of change of name to the Witt-Humphrey Steel Co.

The Pennsylvania Water & Power Co., Holtwood, Pa., is arranging for the early purchase of the Holtwood Power Co., with local steam-operated electric generating plant, operated in conjunction with the hydroelectric power plants of the first noted company. The purchasing company will carry out an expansion program.

E. C. Crowther, 3634 North Fifteenth Street, Philadelphia, has been appointed representative in eastern Pennsylvania, southern New Jersey, Maryland and Delaware for the Mahoning Valley Steel Co., Niles, Ohio, maker of black and special sheets, and for the Thomas Steel Products Co., Warren, Ohio, manufacturer of cold-rolled strip steel up to 17 in. in width. The Crowther organization is also district representative in that territory for the Ohio Nut & Bolt Co., Berea, Ohio; the Lebanon Machine Screw Co., Lebanon, Pa.; the Pawtucket Screw Co., Pawtucket, R. I., and the Shakeproof Lock Washer Co., Chicago.

The Philadelphia Coldak Corporation, 1814 Franklin Trust Building, Philadelphia, has been organized to install and service electric refrigerating equipment, and will be in the market for copper tubing and kindred supplies.

The Eddystone Steel Co., Chester, Pa., has purchased the property of the Pennsylvania Iron Works, the latter company having gone into receivership several years ago.

Cincinnati

CINCINNATI, July 11.

IN the first 10 days of July there has been a further recession in machine tool buying. While inquiries are of fair volume, local builders are of the opinion that sales will be light during the remainder of the month. Occasionally an order for two or three machines is received, but the bulk of current bookings consists of single machines for users in the general industrial field. Machine tool companies are holding production in line with incoming business, and in only a few instances are tools for stock being manufactured.

The Nashville Railway & Light Co., Nashville, Tenn., has bought a 48-in. 300-ton wheel press, and the Weirton Steel Co., Weirton, W. Va., has purchased a 30-in. x 30-ft. engine lathe and a 600-lb. single frame steam hammer. The Pennsylvania Railroad is reported to have placed several punches and shears with a Hamilton, Ohio, company. A Northwestern carrier is expected to contract for two lathes. The Santa Fe, which already has ordered nine lathes, will buy several more engine lathes.

The Cincinnati Machinery & Supply Co., Cincinnati, is inquiring for one No. 93-C Toledo double crank press and one No. 94-B Toledo double crank press, or their equivalents.

The Columbus Auto Parts Co., 15 East Russell Street, Columbus, Ohio, has awarded a general contract to E. H. Latham & Co., 447 Neilson Street, for a new two-story plant to cost close to $50,000 with equipment.

The Premier Washing Machine Co., Sidney, Ohio, will soon take bids on a general contract for a one-story addition. H. L. Loudenbach & Sons, Kahl Building, are architects.

Snyder & Babbitt, 16 East Broad Street, Columbus, Ohio, architects, have tentative plans for a new multi-story automobile service, repair and garage building to cost about $175,000 with equipment.

The Brown-Craven Equipment Co., Chattanooga, Tenn., machinery dealer, is inquiring for a floating pile driver, complete with hoisting engine, hammer, etc.

The River Terminal Commission, Memphis, Tenn., J. B. Edgar, chairman, is preparing plans for a new grain elevator on the river front, to handle bulk grain from barges, with capacity of 1,500,000 bu., to cost upward of $450,000 with machinery, elevating equipment, etc.

The City Council, Nashville, Tenn., has plans under way for a municipal airport, with hangars, shop and other buildings, to cost approximately $40,000. Property has been acquired at the Sloan field.

The Union Gas & Electric Co., Cincinnati, has plans under way for a one-story automobile service, repair and garage building at Norwood, to cost about $65,000 with equipment. The Columbia Engineering & Management Co., 314 West Fourth Street, is engineer.

The Standard Sanitary Mfg. Co., Louisville, will take bids July 15 on a general contract for an addition to its local plant, to cost more than $200,000. Arthur G. Tafel, 140 South Third Street, is architect. Headquarters of the company are in the Bessemer Building, Pittsburgh.

The Taylor Plow Co., Cleveland, Tenn., is planning the early purchase of a number of tools, including a drill press; engine lathe, 24 in. swing, 8 to 10 ft. bed; power hammer, with capacity of 100 lb.; bulldozer; high-speed saw and other tools. The company will build two one-story plant units on site lately acquired, 50 x 125 ft., and 50 x 50 ft. D. R. Bacon is president.

The Southern Motor Co., Memphis, Tenn., will take bids at once for a one-story automobile service and garage building, 90 x 300 ft., with machine and repair shop, to cost about $85,000. Joseph T. Wallace, Bank of Commerce Building, is architect.

The L. J. Breed Equipment Co., James Building, Chattanooga, Tenn., machinery dealer, has inquiries out for a crawler type shovel, ¾-yd. capacity, also for an air separator.

The Queen City Supply Co., Cincinnati, has acquired the supply department of the Lexington Mine & Mill Supply Co., Main and Spring Streets, Lexington, Ky., which will be conducted as the Kentucky division of the company with George D. Liebel as manager.

South Atlantic States

BALTIMORE, July 11.

BIDS will be received by the Board of Awards, office of the City Register, City Hall, Baltimore, until July 20, for a quantity of cast iron lamp posts for the division of lighting. Specifications at the office of the division of lighting, City Hall. C. F. Goob is mechanical engineer.

The proposed merger of the Crown Cork & Seal Co., 1511 Guilford Avenue, Baltimore, manufacturer of metal bottle caps and bottle-sealing machinery, with the New York Improved Patents Corporation, New York, has been definitely abandoned following a third meeting of stockholders, and the local plant will continue as heretofore.

Fire, June 30, destroyed the plant of the Holt Oil Co., Federalsburg, Md., with loss reported upward of $75,000 including equipment. Plans for rebuilding are under advisement.

The Board of City Commissioners, Spartanburg, S. C., has acquired about 100 acres of land for a city airport, to be known as the Spartanburg Municipal Airport, and will soon begin work on hangars, shop and other structures, to cost approximately $40,000.

The Atmospheric Nitrogen Co., Hopewell, Va., operated by the Allied Chemical & Dye Corporation, 61 Broadway, New York, has taken title to a local tract of about 275 acres for its proposed new nitrate plant, on which work will soon begin. The entire project is estimated to cost more than $10,000 with machinery. A power plant will be built.

The Western Maryland Railway Co., Baltimore, has work under way on an expansion program to cost close to $2,000,000. The projects include extensions in the coal pier at Port Covington, Baltimore, to cost $430,000; additional capacity of yards at Hagerstown, Md., $96,000; shop machinery and tools, $75,000; additional tracks at Shippensburg, Pa., $215,000, with other line extensions, bridge construction, etc. The company has applied for permission to issue bonds for $12,000,000.

J. C. Steele & Sons, Statesville, N. C., manufacturers of clay-working machinery, are planning the purchase of a power shear to handle sheets ¾-in. thick, 15 to 36 in. wide.

The City Council, Raleigh, N. C., is said to have leased property for a proposed municipal airport and plans the early construction of hangars, shop and other structures.

Hubbard-Kothe, Inc., 2 McClellan Place, Baltimore, railroad and mill supplies, is in the market for a magnet, 46 in. in diameter, to be used in connection with a crane for handling scrap iron.

The Lexington Water Power Co., Lexington, S. C., operated by the General Gas & Electric Co., 50 Pine Street, New York, has awarded a general contract to the Arundel Corporation, Pier 2, Pratt Street, Baltimore, for its proposed hydroelectric generating plant on the Saluda River, near Columbia, S. C. The station will be equipped for an ultimate output of 200,000 hp., and is reported to cost more than $10,000,000 with power dam and transmission system. The Duke Power Co., Charlotte, N. C., is interested in the project.

Frank Lanier, Americus, Ga., is planning the establishment of a new cold storage and refrigerating plant to cost close to $25,000 with equipment.

The Carolina Power & Light Co., Raleigh, N. C., is arranging for a bond issue of $10,000,000, a portion of the proceeds to be used for extensions and improvements in power plants and system.

The Luray Ice Co., Inc., Luray, Va., is planning to purchase an 80-hp. boiler, either watertube or horizontal, to operate at 125 lb. working pressure, with accessories. E. C. Harnsberger is president.

The Henry Walke Co., Norfolk, Va., is in the market for a set of bending rolls, 10-in. diameter, 10 ft. between housings, to handle sheets ⅜-in. thick, either direct motor drive, or belt-driven.

The Hackley Morrison Co., Inc., 204 Jefferson Street, Richmond, Va., machinery dealer, has inquiries out for a belt-driven air compressor, capacity about 250 cu. ft. per min., Ingersoll-Rand type preferred; also for a 24- to 30-ft. diameter waterwheel, 4-in. face, with segment gear, and a 35,000 to 50,000-gal. capacity steel tank and tower.

The Briggs-Shaffner Co., Winston-Salem, N. C., has been appointed district representative in North Carolina for IXL speed reducers and gear products manufactured by the Foote Brothers Gear & Machine Co., 215 North Curtis Street, Chicago.

The Apex Razor Blade Corporation, 1114 Munsey Building, Baltimore, has been organized to manufacture safety razor blades of the Gillette type. The company contemplates building a plant in the near future, but at present desires to contract for the manufacture of approximately 25 gross of packages of 10 blades each per week.

Pittsburgh

PITTSBURGH, July 11.

A SLIGHT improvement in machine tool business has been noted by some in the trade, but orders for more than single items still are an exception. One firm in the past week sold a 24-in. lathe, a 36-in. open side shaper, a heavy-duty grinding machine and milling machine. The Westinghouse Electric & Mfg. Co. has not yet begun to buy against its quarterly list.

The National Bearing Metals Corporation, Pittsburgh, recently organized to consolidate a number of brass and bronze manufacturing companies, will continue operations at both of its local plants, comprising the works of the Keystone Bronze Co., Foster and Thirty-ninth Streets, and that of the Bronze Metal Co., South Avenue and Sturgeon Street. The plant of the Brady Brass Co., 170 Fourteenth Street, Jersey City, N. J., another interest in the merger, will be closed and operations transferred to the Jersey City works of the Bronze Metal Co., 364 Ninth Street. The plant of the Southern Brass Works, Portsmouth, Va., will be operated as heretofore, as will also the works of the More-Jones Brass & Metal Co., St. Louis. John B. Strauch, head of the last-noted company, is president of the consolidated organization.

The Dravo Contracting Co., Neville Island, Pittsburgh, operating a structural steel and iron works, and steel barge manufacturing plant, has leased a portion of the former shipyard of the Pusey & Jones Corporation, Gloucester, N. J., and will establish a branch works at that location.

The Bureau of Water, City-County Building, Pittsburgh, is considering the construction of an addition to the Ross pumping plant of the municipal waterworks, to cost approximately $200,000 with equipment. Charles M. Reppert, City-County Building, is city engineer.

The National Fireproofing Co., Fulton Building, Pittsburgh, is arranging for an increase in indebtedness of $3,000,000, a portion of the fund to be used for expansion in production. The company operates about 21 plants in different parts of the country for the manufacture of hollow tile, fireproofing products, conduits, etc.

The Pocahontas Fuel Co., Welch, W. Va., is said to be planning the construction of a new tipple at its local Cherokee coal-mining properties. It is understood that the structure will be temporary, to be replaced later by a permanent steel unit.

The Ford Motor Co., Detroit, is said to be negotiating for the purchase of property adjoining its assembling plant at Shadyside, Pittsburgh, for future expansion.

The Nilco Lamp Co., St. Mary's, Pa., manufacturer of electric lamps, will ask bids on a general contract this month for a two-story addition, to cost close to $65,000 with equipment. Charles A. Searing, Farmers' Bank Building, Pittsburgh, is engineer. R. W. Roloff is general manager.

The Chicago Pneumatic Tool Co., 6 East Forty-fourth Street, New York, will soon begin enlargements at its plants at Franklin, Pa., consisting of two main one-story units, 100 x 295 ft., and 180 x 220 ft., to be equipped for machine shop and foundry, respectively. The additions will be given over to the production of air compressors and Diesel oil engines, and will double, approximately, the present output. The expansion is estimated to cost close to $450,000 with equipment. Ernest McGeorge, 3030 Euclid Avenue, Cleveland, is consulting engineer.

Detroit

DETROIT, July 11.

FOUNDATIONS will be started at once by the Yellow Truck & Coach Mfg. Co., 5801 West Dickens Street, Chicago, operated by the General Motors Corporation, Detroit, for its new plant at Pontiac, Mich., to cost in excess of $4,500,000. The new works will total 1,250,000 sq. ft. of floor space, divided into three main units, including assembling plant, body manufacturing plant, and storage and distributing division. The plant is scheduled for completion within six months, and will be given over to the production of GMC trucks, equipped with Buick motors, heavy duty trucks and tractors with capacities up to 15 tons, and taxicabs. A department will be established for the manufacture of sleeve-valve engines now produced in a plant at East Moline, Ill. The present Pontiac plant of the General Motors Truck Co., totaling about 500,000 sq. ft. of floor space, will be used in part for the engine plant, machine shops, engineering division and service departments. In connection with its expansion plans, the company plans the construction of new factory branches and service plants at Chicago, New York, Boston, Detroit, Pittsburgh, Kansas City, Mo., Los Angeles and San Francisco. Paul W. Seiler is president; Louis Ruthenberg, heretofore general manager of the Yellow Sleeve-Valve Engine Works, East Moline, has been appointed assistant to Mr. Seiler, and will be in charge of plant construction.

The Paige-Detroit Motor Car Co., West Warren Street and the Detroit Terminal Railroad, Detroit, recently acquired by Joseph B., Robert C., and Ray A. Graham, has begun an expansion program at the former plant of the Wayne Body Corporation, Wayne, Mich., lately purchased, to include the erection of an addition for increase of about 40,000 sq. ft. in plant area, making a total of 240,000 sq. ft. of manufacturing space. The works will be given over to the production of custom bodies on a quantity basis and considerable new machinery will be installed. Joseph B. Graham is president of the company; Robert C. Graham, vice-president, and Ray A. Graham, secretary and treasurer.

The Detroit Gray Iron Foundry Co., 6403 Wight Street, Detroit, has awarded a general contract to Max Bartholomaei, Son & Co., 1574 East Warren Avenue, for its two-story foundry addition to cost in excess of $30,000. Mildner & Eison, Hammond Building, are architects. Harry H. Wyatt is secretary and treasurer.

The Reynolds Spring Co., Jackson, Mich., manufacturer of automobile springs, etc., has work under way on an expansion program to provide for increased floor space and the installation of additional equipment. A considerable part of the additional facilities will be given over to cushion spring manufacture.

The Belding-Hall Refrigerator Co., Belding, Mich., has awarded a general contract to Edward J. Esch, 67 Richards Street, N. W., Grand Rapids, Mich., for a three-story addition to cost about $60,000.

The A. C. Spark Plug Co., Flint, Mich., has asked bids for an addition to cost close to $250,000 with equipment.

The Michigan Smelting & Refining Co., 7885 Joseph Campau Avenue, Detroit, is disposing of a bond issue of $800,000, a portion of the fund to be used for the acquisition of the Capitol Brass Works, 2306 Franklin Street, Detroit, and the Acme Brass Works, Hamtramck, Mich., recently taken over, to be operated as subsidiaries, and for increase in facilities carried out at the main plant.

The Cass-Congress Garage, 328 West Congress Street, Detroit, is planning the erection of a three-story addition, exclusively for service and repair operations, to cost close to $100,000.

The Wilmarth & Morman Co., Grand Rapids, Mich., manufacturer of precision grinding machine tools, has become

affiliated with the Machinery Co. of America, Big Rapids, Mich., the latter company to act as its distributing agent. Other units for which the Machinery company will act in a similar capacity are the Covel Mfg. Co., Benton Harbor, Mich., the Baldwin, Tuthill & Bolton Co., Grand Rapids, and the Hanchet Swage Works, Big Rapids.

The Lake Shore Brass Works, Holland, Mich., has been organized to manufacture brass and aluminum fittings and valves. The company has leased a factory and is installing the machinery, all of which has been purchased.

The Detroit Piston Pin Mfg. Co., Detroit, has started the erection of a new plant at Holland, Mich., to cost $15,000.

Gulf States

BIRMINGHAM, July 11.

THE Southern Cotton Oil Co., Produce Exchange, New York, will make extensions and improvements in the power department at its mill at Decatur, Ala., to include the installation of boiler and generator equipment, with accessories, to cost approximately $60,000.

The Southern States Steel Corporation, Dallas, Tex., recently organized with a capital of $50,000, will operate a local plant. The company has arranged for a change of name to the Owen-Hughes Steel Co. D. A. Frank and S. R. Tyler, Dallas, are interested in the company.

The Panhandle Motor Co., Clarendon, Tex., has completed plans for a one-story service and machine repair shop, 45 x 75 ft., and plans the early purchase of an air compressor and tools. H. B. White is head.

The Linde Air Products Co., 30 East Forty-second Street, New York, is said to have acquired a site at Tampa, Fla., for a new plant, to cost in excess of $350,000 with equipment.

The United States Engineer, Mobile, Ala., is asking bids until July 20, for two Scotch marine type boilers, circular 747.

The Lake County Board of Public Instruction, Tavares, Fla., is considering the installation of manual training equipment in a proposed new senior and junior high school at Leesburg to cost $300,000, for which superstructure will soon begin. H. M. Griffin, 512 Main Street, Daytona Beach, Fla., is architect.

Fire, July 4, damaged a portion of the storage and distributing plant of the Standard Oil Co. of Louisiana, Baton Rouge, with loss reported at close to $50,000.

The Board of Water Commissioners, Houston, Tex., is planning an early call for bids for the construction of three power plants, each to be equipped with gas engine-operated electric generating unit and auxiliaries, for emergency service for the municipal waterworks, to cost upward of $65,000. H. B. House is water commissioner.

The Marshall Wood Products Co., Marshall, Tex., recently organized by N. P. Turner, Marshall, and associates, is making arrangements for a new plant, consisting of two one-story factory units and two warehouses, to cost more than $75,000. The company has acquired the plant and business of the Linden Chair Works, Linden, Tex., and will consolidate with its organization. It is proposed to remove the business to Marshall as soon as the factories are completed.

The City Council, Monroe, La., is planning an early call for bids for equipment for extensions and improvements in the municipal waterworks, including pumping machinery, steel tank and tower, etc. The entire project will cost about $600,000. The Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

Godfrey L. Cabot, Inc., Old South Building, Boston, manufacturer of carbon gas products, will proceed with the construction of a new plant at Skelly, Carson County, Tex., to cost upward of $200,000 with equipment. The company has contracted with the Skelly Oil Co. for natural gas supply for operation.

The Mobile Steel Co., Mobile, Ala., has filed plans for a one-story machine shop at its plant on North Commerce Street.

The Amarillo Clay Products Co., 609 Taylor Street, Amarillo, Tex., recently organized with a capital of $250,000, has acquired property in the eastern section of the city as a site for a new plant for the manufacture of brick and tile, to cost $150,000 with machinery. It has also secured clay lands in Dallam County, Tex., and Union County, N. M., and will install mining, conveying and other machinery for operation.

The Iron City Chandelier Co., 2033 First Avenue, Birmingham, recently organized, has taken over a local building and will install equipment at once. It is proposed to develop a capacity of about 1000 fixtures per month. John A. Braun is head.

The Federal Graphite Co., Anniston, Ala., care of John Lewis, First National Bank Building, Birmingham, recently organized by Mr. Lewis and associates, has acquired about 700 acres of graphite lands near Anniston, and plans the installation of equipment to develop an output of close to 500 tons per month. John D. and W. L. McCullough, both of Birmingham, are also interested in the company.

The Houston Power & Light Co., Houston, Tex., is said to be planning the construction of a new equipment storage and distributing plant, with repair department, to cost more than $200,000 with equipment.

The Brookside-Pratt Mining Co., Birmingham, operating in the New River district, Marion County, about 75 miles from the city, is planning the installation of additional equipment, including washing plant, concentrator, coal-handling machinery, etc.

The Reading Iron Co. of Texas, Houston, Tex., has been organized to distribute wrought iron tubular goods in that State. The company has leased property along the tracks of the Southern Pacific Railroad in Houston. L. E. Thomas is president.

The Houston Armature Works, Houston, Tex., has been appointed local representative in that city for the Foote Brothers Gear & Machine Co., 215 North Curtis Street, Chicago, and will operate under the direction of the Foote company's Dallas representative, the George J. Fix Co., 2507 Commerce Street, Dallas.

The Texas & Pacific Railway Co., whose terminal improvements at Fort Worth, Tex., were referred to in THE IRON AGE of July 7, has let further contracts, bringing the total up to about $2,000,000, and the entire work will cost well in excess of that figure. Contracts for the erection of steel buildings have been awarded to the Austin Co., Cleveland, and include a locomotive erecting shop, round house, power house, ice house, welfare service building and others.

The Rice Mfg. & Distributing Co., Inc., Gulfport, Miss., has been organized to manufacture an automatic automobile headlight with rigid shift. Machinery and equipment have been purchased, but the company is in the market for roller bearings, malleable castings and ⅜-in. to ¾-in. steel rods.

St. Louis

ST. LOUIS, July 11.

PLANS are being prepared by the Laclede Gas Light Co., Eleventh and Olive Streets, St. Louis, for extensions in its generating plant to cost $500,000 with equipment.

The Oklahoma Pipe Line Co., Ardmore, Okla., is planning the construction of five booster stations on the route of its Hewitt-DeQueen oil pipe line, to increase the capacity from 20,000 to 33,000 bbl. per day. The plants will be located near Ardmore, at Kiersey, Boswell, Fort Towsen and Broken Bow, and are estimated to cost $200,000 with equipment.

The Arkansas-Missouri Power Co., Little Rock, Ark., will issue stock in amount of $250,000, a portion of the proceeds to be used for extensions and improvements.

R. M. Allen, 2345 Rutger Street, St. Louis, has awarded a general contract to Brockmeyer-Bohle, Inc., Missouri Theater Building, for a one-story tin and metal-working shop, 50 x 145 ft.

The Steinite Laboratories, Inc., Atchison, Kan., manufacturer of radio equipment, is said to be planning an early call for bids for a one- and four-story plant, to cost in excess of $100,000 with equipment. Horner, Wyatt & Rhodes, Board of Trade Building, Kansas City, Mo., are architects and engineers.

The Bureau of Reclamation, Mitchell, Neb., is asking bids until July 26 for the installation of the second unit of the Guernsey power plant, North Platte project, Nebraska-Wyoming.

The Southern Nebraska Power Co., Superior, Neb., has arranged for a bond issue of $500,000, a portion of the proceeds to be used for extensions and improvements, including transmission lines.

The B. & B. Machine & Iron Works, Inc., Oklahoma City, Okla., care of Walter Bozarth, 1409 West Fifteenth Street, recently formed with a capital of $25,000, is said to be planning the early operation of a local plant.

The Black River Hydro-Electric Co., care of W. A. Fuller, Railway Exchange Building, St. Louis, engineer, will soon begin the construction of its power dam and hydroelectric generating plant on the Black River, near Piedmont, Mo., with initial capacity of 10,000 kw., to cost in excess of $3,000,000. A transmission line will be built.

The Board of Education, Oklahoma City, Okla., has plans for a new one-story manual training shop at the central high school, also for a similar shop addition at the Capitol Hill high school. Layton, Hicks & Forsyth, Braniff Building, are architects.

The Faessler Mfg. Co., Moberly, Mo., is reported to be planning the construction of a new one-story plant for the manufacture of tools, to cost approximately $18,000.

The Standard Power Equipment Corporation, St. Louis, has been organized to manufacture cooling towers, spray nozzles, condensers, evaporators, distillers and pumps. It will also represent manufacturers of power plant equipment and render general engineering service. The company will be in the market at all times for power plant equipment for use in the completion of its contracts.

The Circle Corporation, Box 1224, Tulsa, Okla., has been made representative in northern Oklahoma for the Foote Brothers Gear & Machine Co., 215 North Curtis Street, Chicago.

The Roller-Smith Co., 233 Broadway, New York, maker of electrical instruments and circuit breakers, has appointed the Petroleum Electric Co., 217 East Archer Street, Tulsa, Okla., to represent it in Oklahoma.

Indiana

INDIANAPOLIS, July 11.

THE Valley Motor Truck Co., Elkhart, Ind., is considering the rebuilding of the portion of its plant destroyed by fire July 5, with loss reported in excess of $150,000 including equipment.

The Central Fuel Gas Co., Rushville, Ind., recently formed to take over and consolidate the company of the same name and the People's Natural Gas Co., is planning the installation of storage and distributing facilities for reserve supply, to cost upward of $75,000. The new company will be operated by the Insull interests, Commonwealth Edison Co., 72 West Adams Street, Chicago. William J. Henley, Rushville, is one of the heads of the consolidated organization.

Rubush & Hunter, American Central Life Building, Indianapolis, architects, have plans under way for a new two-story and basement automobile service, repair and garage building, 77 x 205 ft., to cost about $100,000 with equipment.

The Indian Refining Co., Lawrenceville, Ind., has plans under way for a new two-story oil storage and distributing plant at Fort Wayne, Ind., to cost approximately $60,000 with equipment.

The Aladdin Mfg. Co., Muncie, Ind., manufacturer of electric lamps, etc., has awarded a general contract to A. J. Glaser, 616 South Mulberry Street, for a one-story addition to cost $23,000.

The Independent Concrete Pipe Co., 201 North West Street, Indianapolis, is planning the establishment of a new plant for the manufacture of reinforced-concrete sewer pipe, 48-in. diameter, in the vicinity of Irvington, following award of contract for such pipe for the proposed Irvington-Pleasant Run intercepting sewer, and which project will cost more than $650,000.

Contracts in excess of $125,000 have been let for machinery and equipment for the Auburn Automobile Co's. plant at Connersville, Ind., purchased last year from the Lexington Motor Co.

The Utility-Strate Mfg. Co., 701 East Jefferson Street, Fort Wayne, has been organized to manufacture frame straighteners. Steel castings are being bought at present from the Ohio Steel Foundry Co., Springfield, Ohio, and other materials are manufactured at the company's own factory.

Buffalo

BUFFALO, July 11.

THE Western New York Water Co., Electric Building, Buffalo, will carry out an expansion program to cost about $1,000,000, including work now in progress. The extensions will include new electrically operated pumping machinery and other power equipment, water tanks and towers, etc. The company has arranged for a bond issue of $600,000, the fund to be used for a portion of the program. F. S. McGraw is president.

Arrangements are said to be under way for the organization of the National Radiator Co., to take over and consolidate a number of companies in northern New York and nearby districts, specializing in the manufacture of radiators for heating service, and other heating equipment, including the Utica Heater Co., Utica, N. Y.; Pierce, Butler & Pierce Mfg. Corporation, Syracuse and Oswego, N. Y.; Niagara Radiator & Boiler Co., North Tonawanda, N. Y.; Continental Heater Corporation, Dunkirk, N. Y.; National Radiator Co. and the Union Radiator Co., both of Johnstown, Pa.; and the Gurney Heater Mfg. Co., Oliver Street, Boston. The new organization proposes to carry out an expansion and improvement program at the different plants. It is understood that Edward Norris, now president of the Utica Heater Co., will occupy a like position in the new corporation, and that headquarters will likely be in that city.

The Department of Public Works, Buffalo, Edgar W. Fennie, commissioner, is planning an early call for bids for a recording scale for the Lackawanna sewage disposal plant.

T. H. Williams, Deveroux Building, Utica, N. Y., architect, has plans under way for a new four-story automobile service, repair and garage building, to cost about $125,000 with equipment.

Marcus Helfand, recently appointed receiver for the Owego Bridge & Iron Co., Owego, N. Y., is stated to be planning continuance of operations at the local plant. The liabilities are said to total $55,000, and the assets, $85,000.

The Buffalo Forge Co., 477 Spring Street, Buffalo, manufacturer of mechanical draft equipment, fans, etc., has filed plans for extensions and improvements in one of its buildings to cost $40,000.

The Northern New York Utilities, Inc., Watertown, N. Y., is planning the construction of a new power substation on site lately acquired at Oswego, N. Y., to cost upward of $75,000 with equipment.

The Erie, Pa., plant of the Modern Tool Co., a unit of the Consolidated Machine Tool Corporation of America, will be removed to Rochester, N. Y., according to a recent announcement at Erie.

The Globe Malleable Iron & Steel Co., Syracuse, N. Y., has changed its name to the Globe Forge & Foundries, Inc.

Milwaukee

MILWAUKEE, July 11.

MACHINE-TOOL business continues quiet and sales have fallen below those of a year ago. Inquiry also is light. The automotive industry is doing little in the way of acquiring new equipment, but its requirements for necessary replacements are of moderate proportions. General industries furnish the bulk of the relatively small volume of business passing. Locally, dealers find an absence of the usual demand developing from new plant construction or extensions, due to the conservatism governing any expansion.

The Chicago, Milwaukee & St. Paul Railway, general offices, 80 East Jackson Boulevard, Chicago, has authorized construction of a rail reclamation plant on a 4½-acre site adjacent to its division shops at Tomah, Wis. A similar plant was established at Savanna, Ill., some time ago. John Reinehr is superintendent at Tomah.

The Board of Industrial Education, Green Bay, Wis., has approved plans for the proposed new central vocational school, designed by Foeller & Schober, local architects, and will call for bids as soon as the Common Council takes final action upon a bond issue of $250,000 to cover the cost of building and equipment. The structure will be 120 x 150 ft., three stories and basement. Harvey L. Stewart is secretary of the board.

The American Appliance Corporation, West Bend, Wis., has been incorporated with an authorized capitalization of $100,000 to manufacture labor-saving appliances and devices, principally power washing machines. The principals are Arthur H. Labiskey, Ripon, Wis., associated with similar industries for many years, and Will M. Burkhart and Frank W. Bucklin of West Bend. Definite plans for manufacturing are now being completed.

The Village Board, Shorewood, P. O. Milwaukee, Wis., is asking bids until Aug. 1 for the construction of a municipal garbage plant, consisting of a 30-ton minimum, 24-hr. high temperature destructor Dutch oven type incinerator. T. B. Olson, 1288 Murray Avenue, is secretary of the board.

Bids will be taken after July 15 by the International Harvester Co., 606 North Michigan Avenue, Chicago, for the erection of its new branch house, 100 x 150 ft., including a display room, storage, service and machine shop, at Eau Claire, Wis., to cost $125,000 with complete mechanical equipment. A. B. Clancy, 201 Putnam Street, Eau Claire, is branch manager.

The Board of Vocational Education, Beloit, Wis., F. E. Converse, president, will ask bids after July 22 for the erection of a new vocational training institute, 155 x 160 ft., part two stories and basement, costing $140,000 without equipment. Merman & Skogstad, architects, La Crosse, Wis., are supervising the project.

The Milwaukee Valve Co., 139 Burrell Street, Milwaukee, manufacturer of valves and other brass goods, has increased its capitalization from $100,000 to $250,000 to cover improvements now being made and to provide for future extensions. Details of the proposed work have not been definitely settled. John Fraser, Jr., is president.

The Standard Oil Co. of Indiana is about to ask bids through the division office, 2 Copeland Avenue, La Crosse, Wis., for the construction of a new distributing plant at Eau Claire, Wis. George Rathbun is local manager. Plans are

by Schlinz & Bailey, architects, Chicago. R. N. Allen, 910 South Michigan Avenue, Chicago, is company engineer.

The Cedar Grove Stove Co., Cedar Grove, Wis., is in the market for an electric spot welding machine.

Cleveland

CLEVELAND, July 11.

DURING the past week, Dodge Brothers, Inc., Detroit, placed a round lot of special automatic tools for machining automobile cylinder block heads, which was one of the largest orders to come from the automotive industry this year. Locally, the market continues dull, although one dealer reports sales of 16 new machines during the past few days, mostly in single tool orders. These came from scattered sources entirely outside of the automotive field. There is enough business in prospect to indicate a fair volume of sales during the remainder of the month. Many inquiries, however, that have developed recently have not resulted in orders.

The Arctic Ice Machine Co., Canton, Ohio, has been sold to the York Mfg. Co., York, Pa. The two plants will be operated as separate units and the Canton plant will be enlarged. Thomas Shipley, president of the York company, will be president of the merged company, and H. D. Pawnall, president of the Arctic company, will be its vice-president.

The Kent Machine Co., formerly at Kent, Ohio, has removed its factory and general offices to the plant of the Falls Clutch & Machinery Co., Cuyahoga Falls, Ohio, recently purchased by the Kent company, and its foundry, machine shop, warehouse and general offices are now concentrated at one location.

The B. F. Goodrich Co., Akron, Ohio, has awarded a general contract to the Foundation Co., 120 Liberty Street, New York, for its proposed new mill in the Belvidere district, Los Angeles, to consist of a main five-story unit, 250 x 1200 ft.; warehouses and storage buildings; power plant and other structures, to cost approximately $4,000,000 with machinery. The engineering department, Akron, S. S. Robertson, director, is in charge.

The Ohio Boxboard Co., 1390 East Thirtieth Street, Cleveland, has awarded a general contract to the L. Dautel & Son Co., 5710 Hough Street, for a two-story addition, 60 x 120 ft., to cost approximately $80,000 with equipment. C. W. Hackett is secretary.

The General Tire & Rubber Co., Akron, is having plans drawn for two additions, each three stories and basement, totaling about 100,000 sq. ft. of additional floor space, to cost upward of $250,000 with equipment. The Osborn Engineering Co., 7016 Euclid Avenue, Cleveland, is architect and engineer. William O'Neill is president.

Canada

TORONTO, July 11.

WHILE machine tool sales for the past week were somewhat below the level of previous weeks there is a strong undertone to the market. Inquiries are fairly good, indicating more active buying in the early future. Current business is chiefly confined to sales of single tools with a steady flow of orders reported from the automotive industry, especially garages and automobile repair shops. Some additional orders were recently placed by Canadian railroads in connection with equipment for car shops, but no further lists have appeared from this source. Tools for mining operations are in good demand from northern Ontario and Quebec, and there has also been some buying from British Columbia in this connection.

A large terminal power station for the Gatineau power transmission lines between Toronto and Hull will be erected at Leaside, Ont., by the Hydro-Electric Power Commission of Ontario, University Avenue, Toronto. It is estimated that the undertaking will cost several millions of dollars for buildings, equipment, etc.

The General Motors Corporation of Canada, Ltd., Oshawa, Ont., has plans for the erection of two additional buildings which will bring the expenditure for this year's work up to more than $2,000,000. A new paint shop will be erected at a cost of approximately $200,000 and an addition to the body plant will be built to cost $200,000. Tenders for the two additional buildings will be called immediately by Hutton & Souter, architects, 6 James Street South, Hamilton, Ont.

The Board of Harbor Commissioners, Toronto, plans the construction of a local coal terminal to include a new bridge, automatic weighing and conveying machinery, general equipment, etc. The project will cost $300,000.

Willys-Overland, Ltd., Weston, Ont., proposes to build an addition to its plant.

Work will start immediately by Bray, Caron & Dube, Ltd., 10 St. Peter Street, Belle River, Que., on the construction of a power house to cost $100,000 in Two Mountains County. The plant will be ready to deliver power by Jan. 1, 1928.

Plans are being prepared by Willis Chipman, Mail Building, Toronto, for extensions to the waterworks and sewage plants at Thorold, Ont., to cost $82,000.

The Town Council, Rouyn, Que., will build a waterworks and sewage plant. Frederick B. Brown, 60 St. James Street, Montreal, is engineer.

The X. L. Sand, Gravel & Brick Co., Calgary, Alta., has purchased a site of 91 acres on the Fraser River opposite Annieville, and it is understood that tenders will be called soon for the erection of a wharf and brick manufacturing plant. The first unit of the proposed plant will cost approximately $100,000.

Pacific Coast

SAN FRANCISCO, July 6.

PLANS have been filed by the Rickenbacker Mfg. Co., 6071 South Western Avenue, Los Angeles, for a one-story machine shop, 38 x 50 ft.

The California Corrugated Culvert Co., 409 Leroy Street, Los Angeles, manufacturer of corrugated iron culverts, metal flumes, etc., has purchased a tract of about seven acres in the Laguna-Maywood industrial district as a site for a new plant. The initial unit will be one-story, 70 x 200 ft., with office building, 40 x 65 ft. An electric traveling crane and monorail carrier system will be installed. The entire project will cost more than $150,000.

The Osceola Mining Co., Osceola, Cal., contemplates rebuilding its 5-stamp mill and mining plant partially destroyed by fire June 27, with loss estimated at $50,000 including equipment.

Kay & Brunner, Cypress Avenue and Frederick Street, Los Angeles, manufacturers of electric steel castings, have concluded negotiations for the purchase of property in the industrial district at Alhambra, Cal., for a new plant.

The Union Ice & Cold Storage Co., 354 Pine Street, San Francisco, is completing plans for an addition to its cold storage and refrigerating plant, 300 x 500 ft., at Stockton, Cal., to cost close to $300,000 with equipment.

The National Paper Products Co., Church Street, Stockton, Cal., is having plans drawn for a one-story addition to cost about $150,000 with equipment. It is proposed to begin work early in the fall. V. D. Simons, 435 North Michigan Boulevard, Chicago, is consulting engineer.

The Pechastin Lumber & Box Co., Pechastin, Wash., is planning to rebuild the portion of its mill destroyed by fire June 29, with loss reported at $125,000 including machinery.

The Pacific States Pulp & Paper Co., Becker Building, Aberdeen, Wash., is considering plans for a new pulp and paper mill on the Chehalis River, near Cosmopolis, Wash., with sulphate pulp mill, to cost close to $1,000,000.

The Red Spot Electric Co., Tacoma, Wash., manufacturer of electrical equipment, has awarded a general contract to H. E. Hutchins, 523 South Fifty-fifth Street, for a new one-story plant.

The Consumers' Ice & Cold Storage Co., Ninth and C Streets, Sacramento, Cal., will complete plans this month for a three-story addition to its cold storage and refrigerating plant, to cost $125,000 with equipment. H. L. Lincoln, 354 Pine Street, San Francisco, is engineer.

The Everett Welding Co., Everett, Wash., recently formed by Harold Durham, Everett, will soon begin work on a one-story machine works and welding shop, 50 x 50 ft.

This Southern California Edison Co., Los Angeles, has applied for permission to issue new preferred stock in an amount of $10,000,000, a portion of the proceeds to be used for expansion and improvements in power plants and transmission system.

The Willamette Equipment Co., Portland, Ore., has been made branch distributer in that city for the Gallon Iron Works & Mfg. Co., Galion, Ohio, according to a recent announcement of Y. T. Leftwich, Pacific Coast manager for the latter company, and will handle a complete line of road graders and other road equipment.

Foreign

THE General Motors Corporation, Detroit, has work under way on a branch assembling plant at Stockholm, Sweden, and expects to have the structure ready for machinery installation soon. It is reported to cost in excess of $400,000. The plant is scheduled for completion by the close of the year.

The Victoria State Electricity Commission, Melbourne, Australia, is asking bids until Nov. 28 for high-pressure watertube boilers for State power plants. Specifications at the New York and Chicago district offices of the Bureau of Foreign and Domestic Commerce.

The Montecatini Societa Generale per L'Industria Mineraria ed Agricola, Milan, Italy, generally known as Montecatini, manufacturer of industrial chemicals and allied products, has recently disposed of a bond issue of $10,000,000, a considerable portion of the proceeds to be used for expansion in mines and other properties, including additional equipment.

The Government of the State of Sao Paulo, Sao Paulo, Brazil, is planning the purchase of equipment for sewage system for the city, and American-made piping, plumbing equipment and mechanical apparatus, as well as construction machinery and tools, will be given consideration. Information at the office of the Bureau of Foreign and Domestic Commerce, Washington, reference Brazil 248584; also at the office of the American Consulate, Sao Paulo, C. R. Cameron, consul.

The Willys-Overland Co., Toledo, Ohio, is reported to be negotiating for the acquisition of property in the vicinity of Stockholm, Sweden, as a site for a new assembling plant in that country, to cost more than $300,000 with machinery. John N. Willys, president, has been visiting Stockholm, and will perfect arrangements, it is said, while there.

Plans are under consideration by the Franco-Asiatic Oil Society, Algiers, Algeria, for the construction of a pipe line from its plant at Hussein-Dey to the harbor district of the city. Information at the American Consulate, Algiers, George Tait, vice-consul.

The Kagoshima Electric Co., Tokyo, Japan, has preliminary plans for the construction of a hydroelectric generating plant on Yaku Island, with capacity of 50,000 kw. It is provided that the output be used in connection with the production of nitrogenous fertilizer, and a plant is projected for this purpose. The American Consulate, Tokyo, D. F. Spencer, trade commissioner, has information.

NEW TRADE PUBLICATIONS

Boiler Tests.—Heine Boiler Co., St. Louis. Six-page folder describing tests made at the Riverside Station, Davenport, Iowa, of the United Light & Power Co., on a boiler operated at 400 lb. pressure. Numerous diagrams aid the text in telling the story.

Flexible Shaft Equipment.—Stow Mfg. Co., Inc., Binghamton, N. Y. Loose-leaf catalog devoted to description of the company's flexible shafts and electrical tools. Engineering data relating to flexible shafts and flexible shaft assemblies include a table of hp. transmitted by spring coil type of shaft for different sizes of core. Electric equipment grinders, buffers and drills, also a portable motor-driven hammer.

Milling Machines.—Brown & Sharpe Mfg. Co., Providence. Bulletin of four pages devoted to Nos. 3B and 4B milling machines with standardized spindle end.

Milling Machine Tools.—Brown & Sharpe Mfg. Co., Providence. Booklet of 12 pages, listing arbors, spring chucks, cutters and adapters for use on milling machines having the new standardized spindle end.

Milling Arbors.—Kearney & Trecker Corp., Milwaukee. Bulletin describing arbors, showing pictorially the steps in manufacture. Specifications of various styles of the new standardized arbors are included.

Ball Bearings.—New Departure Mfg. Co., Bristol, Conn. Bulletin outlining some of the advantages of use of the company's ball bearings in milling, boring and other machine tools.

Low-Pressure Oil Burners.—Hauk Mfg. Co., 128 Tenth Street, Brooklyn, N. Y. Two A. C. Nielsen Co., surveys, one of which relates to savings effected by the use of the Hauk Venturi low-pressure oil burners in connection with pair and annealing furnaces installed in 1925 by the Pacific Sheet Steel Corporation, South San Francisco, Cal. The other survey gives data on the use of oil burners of the same type in connection with forging and annealing furnaces at the plant of the Cape Ann Tool Co., Pigeon Cove, Mass.

Storage Water Heater.—Gradon Mfg. Co., 2320 East Tioga Street, Philadelphia. Bulletin 703 of four pages is devoted to storage water heaters of various sizes, with a table showing estimated hot water requirements for various types of buildings and uses.

Handling Equipment.—Link-Belt Co., 910 South Michigan Avenue, Chicago. Book 680, 44 pages, containing illustrations, examples, ratings, capacities and tables, showing how to select typical elevators for handling practically all bulk materials under average conditions.

Electric Motors.—Wagner Electric Corporation, St. Louis. Bulletin 144 of 16 pages, illustrates and describes Fynn-Weichsel motors, designed to operate at unity power factor and available in sizes from 5 to 200 hp. at 1800 to 720 r.p.m., with 60-cycle current. Motors from 10 to 100 hp. at 25 cycles may be had. Illustrations include many characteristic diagrams, together with installation views.

Expansion Joint.—Gradon Mfg. Co., 2320 East Tioga Street, Philadelphia. Bulletin 704 of four pages, featuring double sliding sleeve expansion joint with anchor base. The sleeves have chromium plating to prevent rusting and provide a hard, polished surface.

Shock Absorbers for Pipe Lines.—Gradon Mfg. Co., 2320 East Tioga Street, Philadelphia. Bulletin 705 of four pages describes joints designed to protect turbine and pump casings from oscillations produced by vibrating machinery. Standard sizes from 6 to 48 in., of wrought steel construction, have heavy fabric and rubber sleeves to absorb vibration.

Electric Load Building.—Sangamo Electric Co., Springfield, Ill. Booklet of 32 pages giving a brief account of the various electric service rate systems, supplemented by discussions of some of the important factors involved in scientific load building. The booklet is well illustrated with half-tones and diagrams, covering both the electric rate structures and equipment designed to measure current consumption and demand.

Draw-Cut Machine Tools.—Morton Mfg. Co., Muskegon Heights, Mich. Illustrated bulletin covering the company's line of heavy duty, draw-cut machine tools and special machinery for contract shops. It also includes finished machine keys and Robinson automatic air hose couplings for pipe and hose lines.

Handling Equipment.—Revolvator Co., 336 Garfield Avenue, Jersey City. Bulletin 91-A dealing with the company's hand power model arc-welded revolvable base machine for various handling purposes.

Centrifugal Pumps.—Dean Hill Pump Co., Anderson, Inc. Bulletin 403 describing in detail the construction and operation of the company's ball bearing double suction centrifugal pumps.

Industrial Lubricator.—Alemite Lubricator Co., 1871 Broadway, New York. Eight-page folder dealing with lubrication problems of various descriptions and illustrated by both line cuts and half tones.

Oil Circuit Breakers.—General Electric Co., Schenectady. Bulletins 101A and 706 illustrate and describe station oil circuit breakers of various types, giving much information regarding details of construction and operation.

Branch Office Representatives of The Iron Age

Editorial

Chicago, Otis Bldg.....R. A. Fiske
Pittsburgh, Park Building.....G. F. Tegan
Cleveland, 1362 Hanna Building.....F. L. Prentiss
Cincinnati, First National Bank Bldg.....Burnham Finney
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